FY 2013 NWO Staff

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Jodi Haney        Faculty Associate Director
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Lisa Addis        Graphic Designer/Marketing Director
Jacob Burgoon    Project Evaluator
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Jenna Pollock     STEM in the Park Coordinator/Project pi r² Program Manager
Judith Steiner    iEvolve with STEM Project Manager

NWO Mission
The Center’s mission is to advance science, technology, engineering, and mathematics (STEM) education for people of all ages.

NWO Vision
The Northwest Ohio Center for Excellence in STEM Education aims to advance science, technology, engineering, and mathematics (STEM) education for people of all ages. Our purpose is to work with community partners to (a) generate new knowledge about the science of teaching and learning, (b) apply this knowledge by developing the expertise of K-12 educators and higher education faculty, (c) increase public support for, and understanding of, the STEM subject areas, and (d) stimulate the interest of young people, especially those in underrepresented groups, in these rewarding fields of study and career opportunities.

Dear Friends of NWO,

2012 – 2013 was a very exciting year for NWO. We saw many changes this year, but the most exciting change was the start of our 5-year $7.28 million project from the National Science Foundation: Math and Science Partnership (NSF:MSP) program. We are partnering with BGSU, Perkins Local Schools, Sandusky City Schools, and several local community members on this project aimed at enhancing grades 3-8 education across the curriculum, using citizen science as a foundation for promoting student mastery of the Ohio Learning Standards.

We have continued to find success in funding our activities including, STEM in the Park, NWO Inquiry Series, and the NWO Symposium. These events are very successful and continue to be the focal point activities for NWO. Other changes this year include the addition of new staff members who bring years of experience and new ideas to our team.

We anticipate further growth in FY 14 as we continue our many projects and add new activities to our portfolio. I hope this annual report gives you a glimpse into the efforts of the NWO Staff and Team and heightens your awareness of our efforts in the many areas of STEM education.

Sincerely,
W. Robert Midden, NWO Director
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Goal 1: Develop the expertise of pre-service and in-service teachers in STEM and STEM education disciplines.

**NWO Activities**
- NWO Inquiry Series
- NWO Symposium on STEM Teaching (NWO Symposium)
- Undergraduate and graduate teacher preparation courses or program modification

**Affiliated Activities**
- Grant projects
- Undergraduate professional organizations (BGCTM, BGSECO, etc.)
- Community Resources Workshop

Goal 2: Attract and retain students in STEM disciplines through a progression of educational opportunities for students, teachers, and faculty.

**NWO Activities**
- Ohio Junior Science and Humanities Symposium (OJSHS)
- STEM in the Park
- Grant Projects (GRAMS, BOSEF, etc.)
- iEvolve NSF MSP grant project

**Affiliated Activities**
- Grant projects (ACTION, etc.)
- You Be the Chemist Challenge
- Support and assist with other university recruiting activities

Goal 3: Conduct and communicate collaborative research in STEM and STEM education disciplines.

**NWO Activities**
- COSMOS STEM Education Learning Community
- Faculty presentations at NWO Symposium
- Submitting manuscripts for publication
- Faculty/staff research and participation in NWO

**Affiliated Activities**
- Faculty/staff research and participation in NWO
- Continued support of the development of the Learning Sciences PhD program
- Grant projects

Goal 4: Develop and sustain a regional collaborative alliance including university, school, informal education, and business partners through a shared vision and collaborative spirit for tackling current STEM education issues.

**NWO Activities**
- STEM Consortium Advisory Board & Leadership Team
- NWO website and STEM Resource Center Website
- “NWO STEM Connection” Print and E-Newsletters
- Ohio STEM Learning Network Hub Activities
- Evaluation and Marketing Services for NWO Partners

**Affiliated Activities**
- Community Resources Workshop
- Business and community partnerships on grant projects

Goal 5: Support higher education faculty and future faculty in pursuit of the best practices in STEM and STEM education disciplines to enhance undergraduate and graduate education.

**NWO Activities**
- Professional development for higher education faculty at NWO Symposium and NWO Inquiry Series
- COSMOS STEM Education Learning Community
- Support for faculty development and administration of STEM education research and innovation grant projects

**Affiliated Activities**
- Continued support of the development of the Learning Sciences PhD program
Educator Professional Development and Outreach
**NWO Activities**

**NWO STEM Education Inquiry Series**

**Brief Description**
Sustained professional development is offered by NWO throughout the academic year in the NWO Inquiry Series. The Inquiry Series is a series of STEM professional development workshops that continues to be highly popular with educators in the region. It also functions as a monthly platform for affiliated NWO grant projects and regional educators to come together for project-specific professional development. The Inquiry Series is open to in-service and pre-service teachers, higher education faculty, and business/community partners in the region. Participants can opt to attend only one event or all the Inquiry Series events. **Meets NWO Goal: 1**

**FY 2013 Activity Information**
The 2012-13 NWO STEM Education Inquiry Series was held at WGTE Public Media in Toledo, OH on the following Tuesday nights: October 2, 2012, November 27, 2012, January 8, 2013, February 12, 2013, and March 12, 2013. A $20/night fee was charged for all attendees (undergraduates were charged $10). The theme for this year was “STEM Speaks!” and featured 3-hour long inquiry based presentations from some of the leading names in STEM education research and professional development. Below is a list of the STEM opportunities offered at each monthly meeting and the overall attendance data. All of the events were funded in part by two OSLN/Battelle grants and participant fees. The November 27 event was also sponsored in part by Carolina Biological Supply Company.

<table>
<thead>
<tr>
<th>Date</th>
<th>Session Title</th>
<th>Presenter(s)</th>
<th>Total Attendance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct. 2</td>
<td>Supporting Science Inquiry Through Formative Assessment</td>
<td>Page Keeley, National Science Teachers Association Author</td>
<td>84</td>
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<tr>
<td>Nov. 27</td>
<td>Picture-Perfect Science: Using Picture Books to Guide Inquiry</td>
<td>Emily Morgan &amp; Karen Ansberry, National Science Teachers Association Authors</td>
<td>76</td>
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<tr>
<td>Jan. 8</td>
<td>Everyday Engineering: Integrating the STEM Disciplines</td>
<td>Susan Everett, National Science Teachers Association Author</td>
<td>37</td>
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<tr>
<td>Feb. 12</td>
<td>Generative STEM Teaching Practice Through a Brain-Mind Lens!</td>
<td>Karl Klimek, Square One Education Network</td>
<td>44</td>
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<tr>
<td>Mar. 12</td>
<td>Rethinking Mathematics as a Verb</td>
<td>Daniel Brahier, Bowling Green State University Professor</td>
<td>47</td>
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<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Total Attendance for 2012-13 (Unique Visitors)</th>
<th>Total Attendance for 2012-13</th>
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<tr>
<td>Pre-Service Educators</td>
<td>21</td>
<td>21</td>
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<tr>
<td>K-12 Educators</td>
<td>136</td>
<td>181</td>
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<td>K-12 Administrators</td>
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<td>9</td>
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<tr>
<td>Higher Ed Faculty/Staff</td>
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<td>10</td>
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<tr>
<td>Community/Business Partners</td>
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<td>19</td>
</tr>
<tr>
<td>NWO Center Staff/Facilitators</td>
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<td>31</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>200</strong></td>
<td><strong>271</strong></td>
</tr>
</tbody>
</table>

**Evaluation Summary**

The 2012-2013 Inquiry Series was evaluated using an online survey that was administered after each Inquiry Series event (data were collected from five surveys). The average number of survey responses each month was 36 with an average response rate of 84%. The survey required respondents to rate certain aspects of the Inquiry Series (e.g., engagement, value of information) as well as provide written comments regarding their experience. In general, the results demonstrate that attendees perceived the Inquiry Series to be engaging, valuable, informative, applicable, and motivating. The figure below illustrates the attendees’ responses regarding each Inquiry Series session.

The “overall average” scores reflect the responses to all of the survey items for a given session.

One common theme in the participants’ written comments was the applicability of the presentation in the classroom. Overall teachers felt that much of the information was exceptionally useful, often times even if it wasn’t geared specifically towards their particular grade level. Some teachers wrote, “Great combination of addressing the mathematical practices with examples of how to do that in our classrooms,” and “I came away with some good ideas of ways to integrate STEM into some lessons I already teach.”

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Also, many teachers reacted positively to what they perceived as vast personal growth as educators as a direct byproduct of the presentations. With the implementation of many of the ideas presented by the guest speakers, participants felt their methods of teaching had been vastly improved. Some wrote, “Events such as this inspire me to continue to improve my classroom,” and “I gained valuable knowledge about the Standards for Mathematical Practice which will help me to plan more engaging Math lessons linked to real world experiences.”

**NWO Symposium on Science, Technology, Engineering, and Mathematics Teaching (NWO Symposium)**

**Brief Description**
Over the past several years, the NWO Symposium has brought together hundreds of participants to exchange effective strategies for teaching STEM. This popular event has provided the Center with huge visibility in the community, attracting educators to our long-term professional development opportunities and giving all participants resources and ideas they can use immediately in their classroom or setting. **Meets NWO Goals: 1 & 5**

**FY 2013 Activity Information**
The 2012 NWO Symposium was held for the first time on the BGSU campus on Saturday, October 27. The Symposium began with a keynote address by chalk artist and inspirational speaker Kelly Croy, and continued with five one-hour blocks of content sessions, with an average of 13 sessions being offered during each block. A registration fee was charged for all attendees ($35 for educators and $20 for undergraduate students). Presenters remained free, but for-profit vendors were charged $100. This year we saw a significant increase in attendance, up 54% from the previous year. The number of Pre-Service Educators, in particular, increased by 282% from last year, due in large part to having the Symposium on the BGSU campus. This was the first year that we created session strands which helped attendees determine what sessions were ideal for their personal professional development. One such strand was the “Inquiry in the College Classroom: Enhancing the Undergraduate Experience”. This strand was the first of its kind for the Symposium and targeted recruitment was done to increase the number of higher education faculty attendees. Other strands included, “Putting Creativity to Work: Teaching STEM With Innovation” and “STEM in the Community: Thinking Outside the Classroom”. On the following page is a breakdown of the sessions offered by strand (59 total) and the overall attendance (412).

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NWO Symposium Sessions by Strand

- Inquiry in the College Classroom: Enhancing the Undergraduate Experience
- Integrating Technology in the Classroom
- Putting Creativity to Work: Teaching STEM With Innovation
- STEM in the Community: Thinking Outside the Classroom
- Teaching and Learning in ENGINEERING
- Teaching and Learning in MATHEMATICS
- Teaching and Learning in SCIENCE

NWO Symposium Attendance by Participant Group

- Community/Business Partners
- Higher Ed Faculty/Staff
- K-12 Administrator
- K-12 Educator
- NWO Center Staff
- Pre-service Educators
Evaluation Summary
The 2012 NWO Symposium was evaluated using session evaluation surveys (attendees completed a paper survey for each session they attended) and two online surveys (one for attendees and another for presenters/vendors). The results of the session evaluation surveys indicated that attendees perceived the Symposium sessions to be engaging, valuable, and informative. Furthermore, participants reported feeling motivated to try innovative teaching techniques and planned on sharing the information with their colleagues. The results of the attendee online survey echoed the results of the session evaluation surveys, with 93% of attendees ranking the NWO Symposium overall as either Good (46%) or Excellent (47%). Overall, the attendees ranked the various components of the Symposium (e.g., for food, venue, vendor exhibits) higher than the previous year, indicating the changes that were made for this year’s Symposium resulted in a better event for participants. In addition, many attendees reported coming away from the NWO Symposium with new ideas or resources to implement in their classrooms. One attendee wrote, “Every year I go, I pick up something new or different. I’ve learned over the years that I can always use what I have seen, learned, or experienced some way or some how in my classroom.” The figure below illustrates attendees’ responses to five items on the online evaluation survey.

**Attendees’ Responses to Items on Survey**

- The sessions I attended were engaging.
- The information presented during the Symposium was important to me.
- I will incorporate the information/resources from the Symposium into my professional practices (e.g., teaching, administration, etc.).
- I learned something new from the sessions I attended.
- As a result of the NWO Symposium, I feel more excited about the teaching and learning of science, math, and/or technology.

![Attendees' Responses to Items on Survey Graph](chart.png)
The results of the presenter/vendor online survey indicated that most presenters/vendors perceived that their participation in the Symposium was worthwhile due to the number and receptivity of the attendees at their session/exhibit. Most of the attendees (76%) and presenters/vendors (85%) reported that it was moderately or very likely that they would attend or participate in the 2013 NWO Symposium. The recommendations for the 2013 NWO Symposium are to 1) keep a session strand dedicated to teaching in the university/college classroom, 2) offer more technology sessions, as well as sessions that focus on the new Ohio standards, special education, and problem-based learning, and 3) remind attendees throughout the day to complete the session evaluations. The 2012 NWO Symposium Evaluation Report offers a more thorough account of the implementation and impact of the 2012 NWO Symposium, and can be found at www.nwocenter.org/reports.

“NWO STEM Connection” Print and E-Newsletters

Brief Description
The NWO STEM e-newsletter and STEM Connection newsletter are focused on bringing attention to new programs and events happening in STEM K-16 education. Monthly e-newsletters feature stories about area K-12 schools focusing on STEM learning. Each month also includes a community partner feature story revealing how business and non-profit organizations are working with K-12 schools to enhance STEM teaching and learning. The “NWO STEM Connection” newsletter is published quarterly. Both newsletters feature a hands-on, inquiry-based STEM activity for easy use in K-16 classrooms, upcoming teacher professional development and student opportunities, and STEM resource announcements. Meets NWO Goals: 1, 2, & 4

FY 2013 Activity Information
In 2012-13, NWO continued distributing monthly STEM e-newsletters. During the 2012-2013 school year we published and emailed 10 e-newsletters to 7,000+ educators, administrators, partners, and stakeholders and completed one print newsletter. After analyzing the cost-benefit ratio on the print newsletters, NWO has decided to continue to publish the monthly STEM e-newsletters only.

NWO STEM Resource Center Website

Brief Description
The NWO STEM Resource Center website was created as part of the STEM Consortium grant received by NWO in January 2011 from the Ohio STEM Committee, the Ohio Board of Regents, and the Ohio Department of Education in collaboration with the Ohio STEM Learning Network. The website is designed to be the premier website to visit when looking for STEM teaching resources in northwest Ohio. It is designed mainly to assist preK-12 educators in locating and using STEM resources in the area. Many of the resources are available in other places on the internet, but the STEM Resource Center is designed to put all the information in one searchable database where visitors can narrow their search by many filters including geographical area, grade level(s), subject area(s), type of resources, and many more. The STEM Resource Center can be viewed at http://nwostemresources.org. Meets NWO Goal: 4
Community Resources Workshop (CRW)

Brief Description
This weeklong K-12 teacher professional development workshop began in 1998 through a partnership with The Toledo Museum of Art, The Blade, WGTE Public Media, The University of Toledo, and Bowling Green State University. The 40-hour Monday-Friday summer workshop, currently sponsored in part by NWO, features visits to area organizations that focus on inquiry-based, hands-on learning in both formal and informal settings. Teachers may earn 2 graduate credits from Lourdes University and enjoy meeting education specialists from exciting places such as The Toledo Zoo, Toledo Area Metroparks, Challenger Learning Center, and Toledo Lucas County Library on whom they can call for lesson plans, activities, hands-on resources, and school programming. **Meets NWO Goals: 1 & 4**

FY 2013 Activity Information
In 2013, 29 teachers took part in the Community Resources Workshop (CRW) with activities delivered by Lourdes University, Toledo Area Metroparks, The Toledo Blade, The Mudhens, Challenger Learning Center of Lake Erie West, Imagination Station, Toledo – Lucas County Public Library, Toledo Zoo, WGTE Public Media, and several guest speakers. Highlights included a visit to the Toledo Zoo, and a walking tour of downtown Toledo including the Valentine Theater and The Blade. For the first year, CRW included 5 graduate students from Lourdes University who assisted the teachers in using online tools for daily reflections.

Evaluation Summary
The 2013 Community Resources Workshop was evaluated using an online survey that was completed by 27 participants (93%) after the workshop. The results of the survey demonstrate that participants perceived the workshop to be of high quality and highly valuable. The findings also indicate that as a result of attending the CRW, participants were significantly more aware of community resources, held more positive attitudes regarding the use of community resources in their classroom, and planned to increase their use of community resources in their classroom. The most prominent outcome was the participants’ self-reported change regarding their awareness of community resources, particularly low cost alternatives to field trips. Overall, comments given by participants regarding the CRW were extremely positive. Many of the teachers specifically wrote positive comments regarding the organization of the workshop and the value and applicability of the resources to their classroom. The 2013 Community Resources Evaluation Report offers a more thorough account of the implementation and impact of the workshop, and can be found at [www.nwocenter.org/reports](http://www.nwocenter.org/reports).
Rural STEM Learning Platform

Brief Description
The new STEM learning platform is intended to provide a model for rural schools that struggle with the challenge of offering a rich array of stimulating and engaging STEM courses based on problem-based learning, hands-on inquiry, and partnerships with STEM businesses due to low enrollments and lack of resources. This is being overcome in part by sharing courses among multiple school districts via distance learning, video conferencing, shared staff, and inter-school visits. The new model is being developed among the nine public school districts of Putnam County, coordinated by the Putnam County Educational Service Center.

This effort is based on the impressive record of achievement of these schools in their highly effective STEM programs. It involves creating a number of new, innovative STEM courses that will be shared among all nine school districts and made available to all students throughout the county via multiple modes of distance learning. Meets NWO Goal: 4

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Literacy Design Collaborative College Ready Tools

Brief Description
The Ohio STEM Learning Network is coordinating the adoption and dissemination of the Literacy Design Collaborative College Ready Tools (LDC-CRT) throughout school districts in the state. One STEM school in each region is serving as the first adoption site. At each of those schools, four teacher leaders have been trained in the use of LDC-CRT and are teaching the other teachers in their school to also use these tools. Each of the regional STEM Hubs are supporting this development. When the first schools have fully adopted LDC-CRT they will then train three other schools. Those schools will train others and eventually LDC-CRT are expected to be used throughout the state. CRT is a system of learning for all of the core academic disciplines including English language arts, social sciences, natural sciences, and mathematics. CRT focuses on development of literacy skills within each of these primary domains with the aim of improving student mastery of the common core standards. The goal is to establish an aligned system for teaching college-ready literacy in all subject areas with a well-defined methodology and a clean, understandable structure. As a result, students will engage in more intense literacy practices than they now generally experience, integrated throughout all of the core disciplines, to deepen their learning and improve their critical thinking and communications skills. Meets NWO Goals: 1, 2, & 4

FY 2013 Activity Information
In northwest Ohio, Perkins Local Schools is serving as the first school to adopt LDC-CRT, thus providing inspiration and support for adoption in other schools throughout the region. A team of four teachers from Perkins Local Schools, one in each of the four core academic disciplines, participated in LDC training initiated through the Ohio STEM Learning Network in conjunction with Battelle and the Gates Foundation. These four teachers are piloting the use of CRT modules in their classes and have trained other core discipline teachers in Perkins High School. Perkins will be offering this training to other schools in the region during the 2013-14 academic year.
FY 2013 Activity Information

Putnam County School Updates
In addition to the achievements listed below, many of the schools have purchased tablets for eighth through twelfth grade students to further their education and familiarity with technology. Over 200 students spread throughout the nine county schools are doing field research in partnership with BGSU and the Village of Ottawa as part of the Manure Treatment Feasibility Study. Sixty teachers throughout the county will also be trained in the use of tablets in the classroom as a result of a grant received through partnership with BGSU.

Columbus Grove:
Currently offering four years of High School of Business, Bio Medical Classes, AP courses in Calculus, Statistics, English Literature, and U.S. History. The high school physics teacher was awarded a “Square One Incubator” grant focusing on student-based STEM projects.

Continental:
Currently offering courses in Microsoft Office, Flash, Adobe Photoshop, and Vocational Agriculture. Offering STEM focused PCS Edventures curriculum in the K-6 after school programs.

Ft. Jennings:
Currently offering an Environmental Science course for preK-12 students. The Envirothon team also tied for first place.

Kalida:
Currently offering both Project Lead The Way: Engineering and Biomedical classes. Participated in the VEX Robotics Competitions.

Leipsic:
Currently offering High School of Business and Vocational Agriculture programs. Purchased 30 Chromebooks for educational purposes throughout the district. Offering STEM focused PCS Edventures curriculum in the K-6 after school programs.

Miller City:
Currently offering Vocational Agriculture courses and Project Lead The Way: Engineering and Biomedical courses. The high school science teacher partnered in the “Square One Incubator” grant focusing on student-based STEM projects.

Ottawa – Glandorf:
Currently offering Project Lead the Way: Introduction to Engineering, Principles of Engineering, Digital Electronics, and Principles of Biomedical Sciences. An OG student was the national winner of the 2013 STEM Video Game Challenge.

Ottoville:
Currently offering a locally designed Principles of Engineering course and an Environmental Science course. Beginning at the middle school level, the district offers several robotics classes.

Pandora – Gilboa:
Currently offering Project Lead the Way: Principles of Biomedical Sciences, Human Body Systems, and Medical Interventions.
STEM Training Center at the Toledo Technology Academy

Brief Description

The Ohio STEM Learning Network (OSLN) has established seven STEM Hubs and eight training centers throughout the state of Ohio. While each Hub is unique, all are coordinated under the realm of advancing STEM disciplines within their region, and each serves the schools in its region by providing a variety of resources to encourage and support the adoption of best practices and teaching and learning in STEM subject areas.

NWO serves as the Northwest Ohio OSLN Hub for a 29-county region and contains a regional STEM training center at Toledo Technology Academy (TTA). TTA is a magnet high school formed by a highly successful collaborative venture between Toledo Public Schools and many local businesses and scores in the top academic tier of schools in Ohio. Along with a mission to deliver high quality academics and world-class technology, TTA provides:

• Professional development sessions for teachers.
• Visits of teacher leaders to schools to demonstrate use of best practices in classrooms and to discuss STEM education with teachers and administrators.
• Hosting visits of teachers and administrators at the training center to watch best practices in use in the classroom.
• Providing access to video recorded classroom sessions that demonstrate exemplary practices.
• Providing access to live video streaming of classroom activity.

TTA specializes in extensive and productive partnerships with regional STEM-related businesses. The academy is transforming the way students learn and develop 21st century skills by offering real-world experiences and classes not found in a more traditional high school curriculum.

The topics that TTA will offer includes:

• Senior capstone projects using Problem Based Learning
• Diverse and intense hands-on training
• Preparation and skill sets for employment and/or secondary education
• Industrial specific Certifications
• Leadership training
• Practices for developing and strengthening partnerships with businesses.

Meets NWO Goals: 1, 2, & 4
NWO Grant Projects

iEvolve with STEM

Brief Description
The iEvolve with STEM project is funded by the National Science Foundation: Math and Science Partnership Program. This 5-year project aims to improve science teaching through intense professional development of teachers, with an emphasis on inquiry-based learning and involvement in citizen science research. The project is led by NWO at BGSU with Dr. W. Robert Midden acting as the Principal Investigator. Project partners include Bowling Green State University, Erie Soil and Water Conservation District, Lourdes University, Toledo Area Metroparks, NWO, The Ohio State University: Stone Lab, Perkins Local Schools, Sandusky City Schools, The University of Toledo, and the Toledo Zoo. Key innovations are (1) students and teachers in grades 3 – 8 participate in science research projects led by professional scientists in association with a variety of community and higher education partners; (2) teachers learn how to lead students in science research by participating in a rigorous 3-year program of professional development as members of professional learning communities; (3) teachers and students learn to lead through publication of their findings to their peers, to their local communities, and to the professional science community; and (4) teachers adopt efficient strategies for differentiating instruction to maximize learning for all students.

Two cohorts of approximately 50 teachers each will participate in the project, with the first cohort focusing on teachers of students in grades 3 – 5 (years 1 – 3) and the second cohort working with teachers of grades 6 – 8 (years 3 – 5). The first year of each cohort will center on learning how to use inquiry in the classroom, while the second year will incorporate citizen science research. In the third and final year, teachers and students will disseminate their research findings. Throughout the three years, teachers will meet regularly in Professional Learning Teams (PLTs) to continually evaluate and revise their instructional practices. Meets NWO Goals: 1, 2, 3, 4, & 5

FY 2013 Activity Information
The iEvolve with STEM grant was awarded in the fall of 2012 for a total of $7.28 million, which was followed by recruitment and registration of 56 teachers in grades 3 – 5. A Curriculum Development Team was formed with representative teachers across districts and all designated grade levels, to revise and align the curriculum to better incorporate inquiry learning and integrate content from other subject areas. Both the Perkins Local and the Sandusky City School districts have worked together to share materials, facilities, and personnel for implementation of the new science curriculum in the fall of 2013. The first cohort of teachers participated in a two-week summer institute in June to deepen science content knowledge and learn how to implement the new Full Option Science System (FOSS) materials, which center upon inquiry-based science. Teachers also learned specific ways to holistically differentiate science instruction in this new context.

Evaluation Summary
The iEvolve with STEM summer institute was evaluated using a baseline pre-institute survey and a follow-up post-institute survey, both developed and administered online by Horizon Research Inc., who are serving as the external evaluators for this project. The surveys were developed to measure several important variables,

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including teachers’ beliefs, teachers’ use of best-practices, teachers’ self-confidence in teaching science, and leadership. In addition, the surveys measure teachers’ perceptions of the quality of various project components such as the Professional Learning Teams (PLTs) the teachers engaged in during the summer (and will continue during the school year). Findings from these surveys are currently pending.

Much work was also done during this fiscal year in preparing student evaluation and research instruments to be used in the fall of 2013. The iEvolve Research Team developed three content assessments (one for each grade, three to five) and a motivation and engagement survey. The content assessments were developed according to a rigorous process that included several iterations of alignment to the Ohio Revised Content Standards, review by a panel of scientists and teachers, and pilot testing. The motivation and engagement survey was developed in consultation with Stuart Karabenick and his research group at the University of Michigan. Dr. Karabenick has years of experience working with National Science Foundation projects, and has published extensively regarding teacher and student motivation. The upcoming fiscal year will yield more evaluation results including teacher interviews, classroom observations, and results from the student assessments and surveys.

### History Lab

**Brief Description**

History Lab is a professional development project funded by the Ohio Humanities Council that aims to (1) increase teachers’ knowledge of traditional American history and science content (2) improve their ability, with the aid of humanities scholars, education faculty and informal educators, to translate this knowledge to students to improve acquisition and retention, (3) raise teachers’ awareness of and knowledge about regional historical sites, (4) increase student knowledge of local history and science content and 5) to improve the attitudes of students toward history, science, and culture through inquiry-based, hand-on activities. **Meets NWO Goal: 1**

**FY 2013 Activity Information**

History Lab engaged ten northwest Ohio teachers in a three-day summer workshop focused on improving teachers’ knowledge of American history and the instructional resources and strategies most effective in teaching American history.

**Evaluation Summary**

The History Lab summer workshop was evaluated using a content knowledge assessment and a focus group interview. The results of the content knowledge assessment demonstrated that teachers significantly increased their knowledge about American history, specifically regarding the War of 1812, features of Fort Meigs, and Native American-European relations. In addition, the focus group interviews indicated that teachers perceived the workshop to be valuable and effective in improving their knowledge about history as well as their instructional practices for teaching history. Most teachers reported thinking about the project to at least some extent when planning their history instruction for the school year. Teachers observed that their students were excited and engaged during the activities related to the History Lab project. Teachers’ suggested that their experience in History Lab allowed them to better relate history content to their students, and therefore better facilitate student learning.
**Project pi r² THREE (Partners in Inquiry Resources and Research THREE)**

**Brief Description**

Project pi r² unites the resources of NWO and BGSU in conjunction with principal partner Toledo Public Schools, a high-need local educational agency, and additional partners Challenger Center of Lake Erie West, Educational Service Center of Lake Erie West, Imagination Station, Ohio Energy Project, Toledo Botanical Garden, and Wood and Lucas County Soil and Water Conservation Districts for a proven model in professional development. The Principal Investigator on the project is Dr. Emilio Duran of Bowling Green State University’s School of Teaching and Learning. The program’s overall goals are to (a) improve teachers’ content knowledge in science; (b) increase teachers’ use of reform-based teaching strategies in science; and (c) improve student achievement in science. **Meets NWO Goal: 1**

**FY 2013 Activity Information**

Project pi r² THREE is a $94,743 Ohio Board of Regents: Improving Teacher Quality funded grant spanning across FY 2013 and FY 2014. The project provides 30 grades 2 – 5 teachers with 105 hours of thorough and sustained professional development and reaches over 1,200 students in high needs schools with state-of-the-art inquiry science education. The teachers who participate in the project represent nineteen different schools from northwest Ohio, seventeen of which are public. Teachers started with the project in July 2013 by attending an eight-day summer institute. This professional development opportunity provided exciting opportunities for teachers to participate in hands-on content sessions relevant to the revised science standards at each grade level. Experienced science educators (all lead classroom teachers in their districts) along with scientists delivered high quality investigative sessions in a 5E lesson format along with assistance of community resource partners. Teachers came away with ready-to-go units to implement in their classrooms and have the opportunity to invite the community resource partners into their classrooms to collaborate in extending science concepts with their students.

The summer institute also offered general sessions facilitated by education experts where teachers learned about broader educational topics such as assessment, the new learning standards, the 5E learning cycle, differentiated instruction, and how to create a classroom wiki.

The teachers involved in the project have developed a Project pi r² wiki page where every teacher has contributed lesson plans, videos, photos, web resources, and other information relevant to each grade level’s learning standards. The teachers continually post their own information and explore others’ posted information for the purposes of increasing the effectiveness of their science teaching.

Teachers will continue with the project through the 2013-2014 school year by participating in the highly popular STEM in the Park and NWO Symposium events. Participants will also engage in four cohort meetings in conjunction with the NWO Inquiry Series which will be facilitated in a ‘lesson study’ format as teachers reflect and report on the 5E investigative units in which they are integrating in their classrooms.

*Continued on page 18*
The final phase of professional development will focus on teacher reflective practices. This phase will also include teachers hosting a ‘Science Expo’ in their school where students will work collaboratively to highlight the design process of an investigation completed in the classroom.

**Evaluation Summary**

Evaluation data are still being collected for Project pi r², but preliminary findings demonstrate that teachers find the project to be engaging and impactful on their science knowledge and teaching practices. Teachers responded to a reflection survey after attending the summer workshop, and the responses from this survey indicate that teachers felt re-energized and more prepared to teach science than before. Some of the teachers wrote:

“This Project experience was power packed! It energized my spirit and rekindled my love for teaching. I have been teaching for a while. I have become stuck in routine and began to lose passion for teaching. I am always excited to start the school year, but I have never felt this passionate and better equipped at the same time. I feel like I have a new teacher's passion and an old (experienced) teacher's knowledge, especially in the science field.”

“I definitely think I am a stronger science teacher than I was last year because of this (pi r² three) workshop. I will use the 5E model to engage my students and allow them to explore and engage in their own learning. So many times teachers open up books and have students discuss vocabulary first, and then read a science lesson (which is so boring, but I am guilty of having done that in the past). I will now use the 5E model to engage my students first. I know that science is all about exploring, collaborating, and communicating. Having been able to do that for this workshop really taught me as a teacher that I need to teach science this way. I really need to teach all subjects this way! The students will then take ownership of their learning and learning really becomes an intrinsic motivator.”
Faculty Professional Development and Collaborative Education Research
COSMOS STEM Education Learning Community

**Brief Description**

Faculty, graduate students, and others with a common interest in STEM teaching and learning come together throughout the academic year to collaboratively examine and design high tech and highly engaging environments to enhance student attitudes, motivation, engagement, and ultimately success. The learning community supports the overriding goal of enhancing STEM education for people of all ages. **Meets NWO Goals: 3 & 5**

**FY 2013 Activity Information**

The 2012-13 faculty and staff learning community “HI-TECH STEM Learning Community: Highly Engaging Learning Environments by Design!” was co-led by Dr. Jodi Haney (School of Teaching & Learning and Department of Environment & Sustainability) and Dr. Matthew Partin (Department of Biological Sciences). Members of the community worked together to explore (a) education applications (apps), (b) productivity tools, (c) educational games, (d) social media tools, and (e) HI-TECH devices. The ideas and materials explored during the 2012-13 Learning Community were presented at the 2013 Learning Community Fair. The poster from this presentation can be found in Appendix D.

Participation in the COSMOS STEM Education Learning Community shows a diverse group of faculty and staff participants from 6 university departments and 2 corresponding colleges (Arts and Sciences and Education). The community consisted of 11 regular attendees and met bi-weekly throughout the academic year.
COSMOS Team and Research Dissemination

Brief Description
The Center Of Excellence in Science and Mathematics Education: Opportunities for Success (COSMOS), the BGSU branch of NWO, hosts the COSMOS Team meeting for BGSU faculty and administrators to work with NWO staff to communicate, collaborate, and champion STEM initiatives at BGSU and throughout the northwest Ohio region. This enthusiastic and supportive group has been meeting as a formal group for over 10 years and is committed to advancing STEM education for people of all ages. Meets NWO Goal: 3

FY 2013 Activity Information
Participation in the COSMOS Team shows a diverse group of faculty participants from 7 university departments and 3 corresponding colleges (Arts and Sciences, Education, and Technology). Representatives from 2 unique undergraduate scholarship programs were also in attendance and brought new insight to the group regarding the undergraduate student experience at BGSU. The team consisted of 26 total attendees and met 8 times over the course of the 2012-13 academic year.

A total of 24 refereed presentations and 15 refereed publications focusing on STEM education were accomplished during FY 2013 by COSMOS Team members. A full list of presentation and publications is available in Appendix G.
NWO Faculty Participants

Brief Description
NWO has partners in colleges and universities all over northwest Ohio and southeast Michigan. These faculty assist NWO in many ways, including participating in and/or presenting at the following NWO events: (a) NWO STEM Education Inquiry Series, (b) NWO Symposium, (c) STEM in the Park, (d) OJSHS, (e) STEM Consortium Advisory Board, (f) COSMOS STEM Education Learning Community, (g) COSMOS Team, (h) iEvolve with STEM Facilitation Team, and (i) iEvolve with STEM Leadership Team. Meets NWO Goals: 3 & 5

FY 2013 Activity Information

Faculty Participants by Partner Institutions

Adrian College
Bowling Green State University
Defiance College
Heidelberg University
Lourdes University
Northwest State Community College
Ohio Northern University
Owens Community College
The Ohio State University
The University of Findlay
The University of Toledo
K-12 School, Business, and Community Activities
Business and Community Partners

Brief Description
NWO impacts and works with collaborative partners all over northwest Ohio. Many institutions have become formal partners. Below is a list of some of our most active partners during FY 2013. A complete list of partners as well as the application to become an NWO partner is available at www.nwocenter.org/partners.

Meets NWO Goal: 4

FY 2013 Activity Information

<table>
<thead>
<tr>
<th>School Districts</th>
<th>Educational Service Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>These are the main district collaborations, as cited in our current grant projects; however, we recruit/disseminate to 29 counties.</td>
<td></td>
</tr>
<tr>
<td>Hancock County</td>
<td></td>
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<tr>
<td>Lake Erie West</td>
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<tr>
<td>Mid-Ohio</td>
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<tr>
<td>North Central Ohio</td>
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<tr>
<td>Northwest Ohio</td>
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<tr>
<td>Putnam County</td>
<td></td>
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<tr>
<td>Shelby County</td>
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<tr>
<td>Wood County</td>
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<tr>
<th>Businesses</th>
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<tbody>
<tr>
<td>Ball Corporation</td>
</tr>
<tr>
<td>British Petroleum-Husky, LLC</td>
</tr>
<tr>
<td>Canberra Corporation</td>
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<tr>
<td>Carolina Biological Supply Company</td>
</tr>
<tr>
<td>Cooper Tires</td>
</tr>
<tr>
<td>Delta Education</td>
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<tr>
<td>Educaching by SDG Creations, Ltd.</td>
</tr>
<tr>
<td>Kroger</td>
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<tr>
<td>Libbey Glass</td>
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<tr>
<td>Lubrizol</td>
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<tr>
<td>Mother Hubbard’s Reading Cupboard</td>
</tr>
<tr>
<td>Perstorp Polyols, Inc.</td>
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<tr>
<td>PNC Bank</td>
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<tr>
<td>Sheridan Worldwise</td>
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<tr>
<td>Spectra</td>
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<tr>
<td>Texas Instruments</td>
</tr>
<tr>
<td>The Andersons</td>
</tr>
<tr>
<td>Time Warner Cable</td>
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<tr>
<td>Tony Packo’s</td>
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<tr>
<td>Verizon</td>
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<tr>
<td>Wal-Mart</td>
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<tr>
<th>State Support Teams</th>
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<tbody>
<tr>
<td>Region 1</td>
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<td>Region 6</td>
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<tr>
<td>Region 7</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Community &amp; Non-Profit Organizations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Armstrong Air and Space Museum</td>
</tr>
<tr>
<td>Challenger Learning Center of Lake Erie West</td>
</tr>
<tr>
<td>Erie County Soil and Water Conservation District</td>
</tr>
<tr>
<td>Fort Meigs: Ohio’s War of 1812 Battlefield</td>
</tr>
<tr>
<td>Imagination Station</td>
</tr>
<tr>
<td>Lucas County Soil and Water Conservation District</td>
</tr>
<tr>
<td>Northwest Ohio Educational Technology (NWOET)</td>
</tr>
<tr>
<td>Sauder Historical Village</td>
</tr>
<tr>
<td>The Ohio State University: Stone Lab</td>
</tr>
<tr>
<td>Toledo Area Metroparks</td>
</tr>
<tr>
<td>Toledo Blade</td>
</tr>
<tr>
<td>Toledo Botanical Gardens</td>
</tr>
<tr>
<td>Toledo Museum of Art</td>
</tr>
<tr>
<td>WGTE Public Media</td>
</tr>
</tbody>
</table>
Ohio Junior Science and Humanities Symposium (OJSHS)

Brief Description
OJSHS brings the best and brightest students from Ohio middle and high schools together for a competition to highlight and judge the quality of their research projects in the sciences and humanities. This event is an excellent opportunity for the recruitment of the next generation of scientists, mathematicians, engineers, and teachers. OJSHS is co-sponsored by NWO and a grant from the Academy of Applied Science. Paper and poster presentations by these students demonstrate a level of achievement that would rival some of the very best junior and senior undergraduate students with some even approaching what is expected of beginning graduate students. Past Ohio winners have gone on to win the top award at the National competition, demonstrating the extraordinary talent and achievement of these students. Meets NWO Goal: 2

FY 2013 Activity Information
Bowling Green State University hosted the 3-day event for the fifth year in a row from March 20-22, 2013. This year marked the 50th Anniversary of the OJSHS program. Dr. Karen Bjorkman, a Distinguished Professor of Astronomy and Dean of the College of Natural Sciences and Mathematics at The University of Toledo gave the keynote address. There were 24 paper presentations and over 53 poster presentations. Bluyé DeMessie from William Mason High School was the 1st place winner for paper presentations with his project titled “Sustainable and Low Cost Approach for Cleaning Metal Contaminated Water Using Pyrolyzed Banana Peels”. Bluyé, along with 5 other OJSHS winners traveled to the National JSHS in Dayton, Ohio in April 2013. A complete program and other information about the 2013 OJSHS can be found at www.ojshs.org. Above is a breakdown of attendance data for the 2013 Symposium.

<table>
<thead>
<tr>
<th>Participant Group</th>
<th>Total Attendance for 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>High School and Middle School Students</td>
<td>84</td>
</tr>
<tr>
<td>K-12 Educators</td>
<td>11</td>
</tr>
<tr>
<td>Higher Education Faculty (Poster &amp; Paper Judges)</td>
<td>25</td>
</tr>
<tr>
<td>Staff and Volunteers</td>
<td>25</td>
</tr>
<tr>
<td>Parents and Guests</td>
<td>24</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>169</strong></td>
</tr>
</tbody>
</table>

Evaluation Summary
The 2013 OJSHS was evaluated using an online survey, which was completed by participating students, teachers, parents, paper and poster judges, and OJSHS staff and volunteers. The total number of survey responses was 43 for students and 27 for non-students. The results of the survey demonstrate that both students and non-students perceived the 2013 OJSHS as a high-quality worthwhile event. Almost all of the participants (95%) rated the 2013 OJSHS overall as either good or excellent. Furthermore, most OJSHS components (e.g., evening activities, paper and poster judges, awards ceremony) were rated as good or excellent by more than 90% of participants. The survey results also indicate that the 2013 OJSHS increased student interest in STEM research and careers and provided students with opportunities to network with other students and STEM professionals. And although it is likely that most of the participating students were already interested in STEM, many

Continued on page 26
non-student participants suggested that the OJSHS provided students with motivation to continue learning and conducting research about STEM. The recommendations for the 2013 OJSHS event are to 1) increase the diversity of academic fields represented by OJSHS judges, 2) standardize and enforce the amount of space allowed for each poster, and 3) continue to offer ice skating, curling, and add other activities. The 2013 OJSHS Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at www.nwocenter.org/reports.

**OJSHS continued from page 25**

### STEM Consortium Advisory Board

**Brief Description**
The NWO STEM Consortium Advisory Board was created as part of the STEM Consortium grant that NWO received from the Ohio STEM Committee, Ohio Board of Regents, and Ohio Department of Education in association with the Ohio STEM Learning Network. **Meets NWO Goal: 4**

**FY 2013 Activity Information**
The Board advised and guided the organization, implementation, and assessment of the NWO STEM Hub ensuring that the voices of all STEM education stakeholders of northwest Ohio are heard and regional needs are met. The Advisory Board included members from several different participants groups in order to have adequate representation of all STEM constituencies in northwest Ohio.

The Board met periodically to generate ideas, provide advice regarding direction and strategies, raise awareness of opportunities, foster collaboration, form new partnerships and strengthen existing partnerships, recruit resources for new initiatives, and help to ensure that the Hub is serving the greater good of the entire region. Attendance information by participant group is available below.
STEM in the Park™

**Brief Description**

STEM in the Park is a free NWO event for all northwest Ohio families and the entire community to stimulate public interest and encourage learning in science, technology, engineering, and mathematics (STEM). Held on the campus of Bowling Green State University, the event features three and a half hours of engaging hands-on STEM activities from over 50 area businesses, schools, and organizations along with take-home STEM activity cards for parents and children to continue STEM exploration at home. By increasing awareness in STEM facilities, programs and activities in the area, STEM in the Park is an opportunity for businesses, universities, K-12 schools, and non-profit organizations to showcase innovation, educational opportunities, careers, and to promote positive attitudes toward STEM teaching and learning. *Meets NWO Goal: 2*

**FY 2013 Activity Information**

The September 8, 2012 event provided free lunch for all participants provided by BGSU Dining Services. Over 50 activity station providers were involved in STEM in the Park including many NWO community and business partners and university departments. Presenting sponsors for the event were Kroger and BGSU, with support from The Andersons; BGSU Foundation; BP-Husky, LLC; Battelle; Bowling Green Community Foundation; Carolina Biological Supply Company; Time Warner Cable; NWO; Ohio STEM Learning Network; and Wal-Mart. The event was held at the Perry Field House for the second consecutive year. The attendance was the largest to date, with a total of 2,681 attendees/exhibitors/staff/volunteers (a 57% increase in attendance from 2011). The event attracted families from at least 90 different cities and towns in Ohio and Michigan. Below is attendance data as well as a breakdown of the types of exhibitors at the event. A complete list of exhibitors is available at [http://nwocenter.org/STEMinPark](http://nwocenter.org/STEMinPark).

### STEM in the Park™ Attendance from 2010 to 2012

<table>
<thead>
<tr>
<th>STEM in the Park Participants</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adults</td>
<td>620</td>
<td>617</td>
<td>991</td>
</tr>
<tr>
<td>Children 0-2 yrs.</td>
<td>96</td>
<td>103</td>
<td>150</td>
</tr>
<tr>
<td>Children 3-5 yrs.</td>
<td>201</td>
<td>181</td>
<td>307</td>
</tr>
<tr>
<td>Children 6-10 yrs.</td>
<td>339</td>
<td>355</td>
<td>597</td>
</tr>
<tr>
<td>Children 11-13 yrs.</td>
<td>118</td>
<td>95</td>
<td>160</td>
</tr>
<tr>
<td>Children 14-18 yrs.</td>
<td>31</td>
<td>25</td>
<td>65</td>
</tr>
<tr>
<td>Total Children (0-18 yrs.)</td>
<td>785</td>
<td>759</td>
<td>1,279</td>
</tr>
<tr>
<td>Total Attendees</td>
<td>1,405</td>
<td>1,376</td>
<td>2,270</td>
</tr>
<tr>
<td>Volunteers/Staff</td>
<td>32</td>
<td>65</td>
<td>69</td>
</tr>
<tr>
<td>Exhibitors</td>
<td>177</td>
<td>270</td>
<td>342</td>
</tr>
<tr>
<td>Total Staff and Exhibitors</td>
<td>209</td>
<td>335</td>
<td>411</td>
</tr>
<tr>
<td><strong>Total Attendance</strong></td>
<td>1,614</td>
<td>1,711</td>
<td>2,681</td>
</tr>
</tbody>
</table>

*Continued on page 28*
Evaluation Summary

The 2012 STEM in the Park event was evaluated using two online surveys (one for attendees and another for exhibitors). The total number of responses to the attendee and exhibitor surveys was 268 and 29, respectively. Most of the attendees reported staying at STEM in the Park for the full duration of the event (three and half hours) and visiting 11 to 30 activity stations. Also, 86% of attendees reported that their family had done (or planned to do) one of more of the take home activities that were handed out during the event. In response to the question, “What were your family’s favorite activity stations?” all but three activity stations were listed by at least one respondent, and several respondents wrote that they liked all of the activity stations. This finding indicates that the activity stations were high in quality and appealed to the preferences of many different people. The results of the attendee survey demonstrated that STEM in that Park was successful in engaging attendees in STEM activities, as well as increasing their knowledge and awareness of STEM. Two attendees wrote: “I was VERY impressed by this event. I've worked in higher education for 14 years and at 5 institutions and have never seen a community partnership program quite like this. I REALLY enjoyed it and I think that this is what public higher education is all about. Well done!” and “We were very impressed with the extensive community involvement, as well as the quality of the ‘presenters’. The atmosphere was very positive and encouraging. It was great that kids could wander from place to place and do whatever caught their interest.”
In addition, a majority of the attendees reported that after coming to STEM in the Park, their children were much more interested in STEM and their family was much more likely to do activities related to STEM. The results of the exhibitor survey mirrored those of the attendee survey – most of the exhibitors reported that the children and parents that visited their station were substantially engaged with the STEM activities. In addition, almost all of the exhibitors reported that STEM in the Park was a worthwhile experience, and most reported that being an exhibitor was beneficial for their organization. The recommendations for the 2013 STEM in the Park event are to: 1) increase the length of the event, 2) keep the event indoors, but use a larger space, and 3) organize activity stations by age-appropriateness. The figure below illustrates the attendees’ responses to four of the questions on the attendee survey. The 2012 STEM in the Park Evaluation Report offers a more thorough account of the implementation and impact of the event, and can be found at www.nwocenter.org/reports.

You Be the Chemist Challenge

**Brief Description**
The You Be the Chemist (YBTC) Challenge is a fun and innovative academic competition that engages 5th-8th grade students in learning about important chemistry concepts, discoveries, and chemical safety. Challenge competitions are exciting events that take place across the country, encouraging the collaboration of community organizations, schools, and the chemical industry, as together they educate students about the benefits and value of chemistry. Ohio schools take part in local challenges within their school districts, and winners attend a state competition held in northwest Ohio to qualify for the YBTC National Challenge.

**Meets NWO Goal: 2**

**FY 2013 Activity Information**
Fifty-three 5th-8th grade students from schools all over northwest Ohio competed in the You Be the Chemist Challenge held at Imagination Station in downtown Toledo on April 20, 2013. Competitors answered questions on topics concerning important chemistry concepts, processes, and historical discoveries over eight rounds of elimination until Michael Allen, a 7th grade student at the Franciscan Academy in Sylvania, emerged as the winner. He is the 2012 state of Ohio champion as well. Michael traveled to Philadelphia on June 24, with all expenses paid, to compete against twenty-six other students in the national competition. The Canberra Corporation, the Chemical Educational Foundation, Imagination Station, NWO, PVS-Nolwood Chemicals, Inc., The University of Toledo’s American Chemical Society, and Toledo Public Schools sponsored the 2013 Ohio Challenge. Robert Mendenhall, Director of Science at Toledo Public Schools, chaired the event.

**NWO Role in YBTC in FY 2013**
- Staffing support provided for event organization and planning
- Funding for student awards and certificates of participation
- Advertisement/recruitment via Constant Contact to 7,000+ regional K-12 contacts
Affiliated Grant Projects
Science and Math Education in ACTION (ACTION)

Brief Description
BGSU, in collaboration with three regional community colleges and The University of Findlay, received $3,000,000 in funding from the Ohio Board of Regents through the Choose Ohio First program to recruit and train undergraduates to become Ohio mathematics and science teachers. ACTION focuses on the use of innovative strategies for preparing highly effective science and mathematics teachers for grades 5-12. Students involved in the project participate in: (a) a 5-week summer bridge program preceding the first regular semester of college; (b) a collaborative science or mathematics research team that addresses a real community problem or concern; (c) a co-op or internship work experience in a regional science or mathematics related business or industry; (d) early teaching experiences in a regional school; and (e) the creation of a capstone project that involves applying research techniques to determining the best teaching practices that advance the students’ learning.

Meets NWO Goal: 2

NWO Role in ACTION in FY 2013
• Assistance with the undergraduate research component of the project
• Assistance and advice for project activities and logistics

Building Ohio’s Sustainable Energy Future (BOSEF)

Brief Description
BOSEF is a scholarship project funded by the Choose Ohio First program of the state of Ohio. BOSEF increases the recruitment, training, and graduation of STEM students to supply the growing job markets in renewable energy and sustainable environment technologies. Northwest Ohio has a growing reputation for research, development, and manufacturing in the high technology, renewable energy fields of photovoltaics (PV) and wind. In addition, northwest Ohio has major research and development strengths in environmental analysis and remediation technologies. The University of Toledo (UT), Bowling Green State University (BGSU), and the community colleges of Owens, Terra, and Northwest State work together to leverage the enormous public interest and burgeoning job markets in these fields to recruit, educate, and retain the best and brightest of Ohio’s students to support these rapidly developing high tech professions. Student success is enhanced through a cooperative summer bridge program focused on mathematics, undergraduate research experiences for all, and integration with the Wright Center for PV Innovation and Commercialization, the Lake Erie Research Center, Center of Photochemical Sciences, and the Environmental Remediation and Restoration Experimental Park. It prepares students for scientific and technical careers by providing internships with business, industry, agencies, and non-profits in renewable energy and environmental sustainability fields. Although the primary program focus is on the undergraduate STEM pipeline, it will include PhD students and in-service high school teachers working toward MS degrees. The participating institutions have a comprehensive and vertically integrated approach to STEM education that maximizes student success and provides skilled professionals in these crucial STEM areas. Meets NWO Goal: 2
**Common Core for Reasoning and Sensemaking – Elementary ((CO)^2RES)**

**Brief Description**

((CO)^2RES Elementary is a one-year Improving Teacher Quality grant from the Ohio Board of Regents. ((CO)^2RES Elementary focuses on preparing K-5 in-service teachers for the new Common Core State Standards for Mathematics (CCSSM). This preparation includes over 100 hours of professional development and work for three connected graduate courses. Through the program teachers learn about best practices in teaching mathematics including ways to promote the 8 Standards for Mathematical Practice expected by the CCSSM. Teachers also explore and practice ((CO)^2RES Elementary techniques with their own students, and share their findings with others at state level conferences. **Meets NWO Goals: 1, 2, 3, 4, & 5**

**NWO Role in (CO)^2RES Elementary in FY 2013**

- Financial management of the grant budget
- Evaluation services
- Grant management assistance

**Common Core for Reasoning and Sensemaking – Secondary ((CO)^2RES)**

**Brief Description**

((CO)^2RES Secondary is a one-year Improving Teacher Quality grant from the Ohio Board of Regents. ((CO)^2RES Secondary focuses on preparing grades 5-10 in-service teachers for the new Common Core State Standards for Mathematics (CCSSM). This preparation includes over 100 hours of professional development and work for three connected graduate courses. Through the program teachers learn about best practices in teaching mathematics including ways to promote the eight Standards for Mathematical Practice described by the CCSSM. Teachers are expected to implement ideas from the coursework into daily instructional practice with their own students. Finally, ((CO)^2RES Secondary teachers and instructors share their lessons and experiences with pre-service and in-service teachers, administrators, and support personnel at state-level conferences such as the NWO Symposium on STEM Teaching and Ohio Council of Teachers of Mathematics annual meeting. **Meets NWO Goals: 1, 2, 3, 4, & 5**

**NWO Role in (CO)^2RES Secondary in FY 2013**

- Financial management of the grant budget
- Evaluation services
- Grant management assistance
Granting Access to Mathematics and Science (GRAMS)

**Brief Description**
GRAMS (Granting Access to Mathematics & Science) is a scholarship program supported by two 5-year grants totaling $1,200,000 from the National Science Foundation. In this project, Bowling Green State University collaborates with two regional community colleges, Owens and Terra, to increase the number of highly qualified and capable students who are able to complete degrees in STEM majors by providing approximately 20-30 need-based scholarships and a proven support program to foster student success. Student persistence and success will be fostered with two major projects: (a) our NSF-funded STEP grant project Science, Engineering, and Technology Gateway Ohio (SETGO) and (b) the BGSU Academic Investment in Mathematics and Science (AIMS). These programs include a 5-week summer bridge for entering students, to prepare them for the rigors of college science and math courses; a tiered system of mentoring by peers and faculty; learning communities with monthly events that draw students and faculty together by merging academics and social networking; and summer research opportunities. These strategies have been proven in BGSU’s AIMS program to increase student persistence and success, particularly of under-represented minority students majoring in science and math disciplines and are based on research that has identified the factors that most account for student attrition from these disciplines. *Meets NWO Goals: 2 & 3*

**NWO Role in GRAMS in FY 2013**
- Oversight and management of the grant projects including financial management of the grant budgets
- Direct recruitment of students through AIMS and SETGO at recruiting events
- Advertisement/recruitment to ~ 4,300 regional K-12 contacts
- Advertisement/recruitment at NWO Inquiry Series
- Management of scholarship awards and renewals
- Student advising
- Academic mentoring and support
**Village of Ottawa: Collaborative Research: Regional Water Treatment & Manure Treatment Feasibility Study**

**Brief Description**

The Manure Treatment Feasibility Study and The Regional Water and Sanitary Sewer Feasibility Study are grant projects funded by the Local Governmental Innovation Fund and are undertaken in partnership with the Village of Ottawa and Putnam County Educational Service Center. The projects aim to (1) address the possibility of integrating sustainable manure management practices and long-term regional development while assessing the environmental and economic context of the area of interest, (2) estimate the feasibility of applying an integrated regional water and sewer system approach as a response to growing environmental concerns and regional development, (3) expand the educational potential by including the participation of high school students in the public school districts of Putnam County in the research, development and economic analysis aspects of the studies and (4) increase teachers’ and students’ interest in real science research that could have an important impact on the development of their local communities. **Meets NWO Goals: 2, 3 & 4**

**FY 2013 Activity Information**

Ottawa Grant Projects engaged nine public school districts of Putnam County in 34 workshops that included various research activities and field trips for data collection. The Ottawa Grant Projects provided the teachers from Putnam County schools with scientific protocols designed in accordance with the curriculum programs, various equipment and science kits for water and soil testing. In addition, BGSU students participated in laboratory research related to the manure treatment optimization process and facilitated the workshop sessions at Putnam County schools. Teachers and K-12 students will continue their participation in Ottawa Grant Projects FY 2013 by incorporating the economic analysis aspect of the projects into their classes.
FY 2013 NWO Budget
FY 2013 Income Sources

The table below shows funding sources that supported FY 2013 NWO Activities.

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<tr>
<th>Agency: Program</th>
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<td>BGSU Cost Share</td>
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<td>History Lab • Student Scholarships</td>
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<td><strong>BGSU FUNDS TOTAL</strong></td>
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**TOTAL INCOME FOR FY 2013** $1,629,861.97

Continued on page 37
The table below shows funding sources that supported FY 2013 NWO Activities.

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<td></td>
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**ACTIVITY REVENUE AND SPONSORSHIPS TOTAL**

$78,130.65

*Continued on page 38*
## GRANT PROGRAMS

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<td>Partners in Inquiry Resources &amp; Research (Project pi r² THREE)</td>
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<td>Science Teaching Advancement through Modeling Physical Science (STAMPS III) (BGSU Subaward for Evaluation Services)</td>
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<td>STeM 2 STEM (Ohio Northern University subaward for Evaluation Services)</td>
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<td><strong>GRANT PROGRAMS TOTAL</strong></td>
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*Continued on page 39*
## GRANTS AND SPONSORSHIP PROPOSALS AWARDED IN FY 2013

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<tr>
<th>Agency: Program</th>
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<tr>
<td>Academy of Applied Science</td>
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<td>The Andersons</td>
<td>2013 – 14 NWO Symposium &amp; NWO STEM Education Inquiry Series</td>
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Appendices

A. Community Resources Workshop Recruitment Email
B. Faculty and Student Recognition
C. History Lab Recruitment Email
D. Learning Community Poster
E. “NWO STEM Connection” Print and E-Newsletters
F. NWO STEM Education Inquiry Series Advertising
G. NWO Publications and Presentations
H. NWO Symposium Advertising
I. OJSHS Recruitment Email
J. Project pi $^3$ THREE Recruitment Materials
K. STEM in the Park Advertising
L. You Be The Chemist Challenge Recruitment Email
2013 Community Resources Workshop for Educators
June 17-21, 2013

REGISTRATION NOW OPEN!

 Spend a Week of Your Summer Vacation on a Fun-Filled Field Trip for Educators While You Earn College Credit or 48 Contact Hours!

 Registration Fee: $150

 Registration Fee Includes:
 * Several lunches and one dinner
 * CEUs/Contact Hours for the entire week
 * Teaching resources and hands-on materials

 Join us for an exciting week packed with activities addressing the new Common Core Standards, STEM learning and 21st Century Skills.

 You’ll visit some of northwest Ohio’s best informal and formal education institutions as well as learn about hidden gems to energize classroom instruction!

 Here’s what some participants had to say about last year’s workshop:

 “This workshop is excellent. I’ve lived in Toledo for 27 years and I am amazed how much I did not know was there!”

 “It was well organized and everything was explained thoroughly. A lot of the information can be adapted to the classroom.”

 “Hands-on experience provided useful information to pass on...”

 “I was very impressed with the amount of materials that were presented during these week long workshops.”

 This opportunity is open to all educators, including administrators, homeschooling educators, and pre-service teachers. This workshop is recommended for pre-K-12 educators but is open to all grade levels.

 Online Registration: https://docs.google.com/spreadsheets/d/1DRwXQ3SLUJu0vtdyVNY2JBlbWdoOHc6Mcqxgs-0

 Payment Information: After completing the online registration form you can access the online credit card payment system. You can either pay online through this system or mail a check (payable to BGSU) or purchase order to:

 NWO-Community Resources Workshop
 c/o COSMOS/NWO
 241 Math Science Bldg.
 Bowling Green State University
 Bowling Green, OH 43403

 PLEASE NOTE: TITLE I PART A FUNDS OR TITLE II FUNDS CAN BE USED TOWARD THIS WORKSHOP

 For more information and to register visit:
 http://www.nwocenter.org/CRWICRWhome.htm

 Special on graduate credit!

 In addition, Lourdes University is offering 2 or 3 graduate credit hours for the one-week course at a special discounted rate of just $200 per credit hour. That means you can receive two graduate credits for only $400! Contact Carolyn Jakesic for information at: cjakesic@lourdes.edu

 *The graduate credit fee is on top of the $150 registration fee and can be easily arranged through Carolyn Jakesic at Lourdes University.

 2013 Community Resources Partners
Appendix B: Faculty & Student Recognition
Appendix B: Faculty and Student Recognition cont.

Events in Brief

On Wednesday (Jan. 30), the University community is invited to meet BG SU’s resident "Molly Pitcher" Ruth Hoffman at the Waterman Center brown bag lunch presentation, and later to a screening and scholarship awards presentation on Wednesday (Jan. 30) for the Suicide Prevention Video Contest. Get all the details in Brief.

Present at the Teaching and Learning Fair

The seventh annual BGSU Teaching and Learning Fair is shaping up to be an exciting event with a wealth of new and interesting information. If you would like to share your experience or innovations in teaching or learning, sign up by Friday (Feb. 1).

The fair will be held from 9 a.m. to 12:30 p.m. on Feb. 18 in the Lentz Grand Ballroom. Faculty, staff and graduate students can register to do a poster presentation. Learn more.

For more information, contact Karen Meyers at kmeyers@bgsu.edu or 372-7672.

New app to translate speech into sign language

"It takes a lot of data to drive a human character," according to Dr. Jerry Schnepp, visual communication technology. Schnepp is part of a team engaged in creating an app for smartphones or tablets that will allow people to communicate using American Sign Language (ASL).

He and collaborators at DePaul University in Chicago have created an avatar, "Paula," to sign complex language in 3D animation. Once completed, the app will augment deaf accessibility in short interactions, such as a hotel check-in, where an interpreter would not be hired.

A computer scientist, Schnepp is particularly interested in human-computer interaction and computer graphics, which is exactly what the "ASL Synthesizer Project at DePaul University" encompasses.

Though not deaf himself, he became involved in the digital translation project led by Dr. Rosalie Wolfe, director of the Human-Computer Interaction Program. At DePaul, he was a graduate student at DePaul, and has continued working on it since joining the BGSU faculty this semester.

The group has broken down ASL into its component parts: hand shapes, palm orientation, movement, location, and nonmanual signals, which include facial expression, gaze and posture. They are geometrically decomposing each aspect in order to program "Paula" to form all the pieces seamlessly, utilizing existing voice-recognition software as the intermediate step between the spoken word and the signs.

"It's an iterative design," Schnepp said. "We develop components and then show them to deaf users for feedback." For additional testing, the group held a booth at the annual Deaf Nation Expo in Chicago, where they invite attendees to preview the software and give their opinions.

Zoom News is provided as a service to BGSU faculty and staff.
Appendix B: Faculty and Student Recognition cont.

Preschool unveils science playground

WRITTEN BY JORDAN CRAYERS SENTINEL STAFF WRITER

SUNDAY, OCTOBER 20, 2013 07:49

The Jordan Center has a new "science playground" designed to incorporate hands-on learning while still teaching to the standards.

The playground caters to six areas of science: light, sound, living things, earth materials, water and force. The playground learning is led by Bowling Green State University professor Dr. Eric Worth and his methods students in the early childhood education program.

The new space, along with updates to the Creativity Studio and outdoor area, will be shown off Monday during an open house at the center from 9 to 11 a.m. and 1 to 3 p.m. Plenty of student artwork, including murals, ceramic tiles and paintings all inspired by Claudia Mary, will be on display.

Within the science playground, young students work in small groups and rotate through the six stations. They learn force through a hand-built roller coaster; how light creates reflections and shadows; determine what sinks and what floats; and can touch and feel seeds and nuts in the living things area.

"With small groups like this, we can do a lot of hands-on and we can let them touch and feel and be messy," said Mary Ann Culver, director of the Jordan Center's Creativity Studio.

Angela Bregman is the artist-in-residence there and designed the Science Playground. Worth gave her some guidelines, but aside from that, her canvas was a blank slate.

"The main thing he said he wanted me to do was show the children in action so the real children doing what to do," Bregman said.

The area features murals of children participating in the learning stations and experiments. The Creative Studio, now in its second year, benefits students from Bowling Green City preschools, Headstart preschools and BGSU's Child Development Center.

Its updated outdoor space, which includes gardens and painted towers, is designed to depict the Creativity Studio's featured artists who are incorporated into the curriculum.

Early Childhood Education students also help out in the Creativity Studio where instructors target science, art, math and literature.

"We still follow the standards, but we do it in a way that is hands on," Culver said.

BGSU's Kids' Tech University opens world of science

WRITTEN BY SENTINEL STAFF WRITER

THURSDAY, NOVEMBER 21, 2013 07:19

Following the launch of the Kids’ Tech University program at Bowling Green State University last year, the university has announced the lineup of invited speakers for the 2013 program. Kids’ Tech is designed to let kids explore scientific concepts through hands-on activities as they discover more about the world and nature, while nurturing the future workforce in science, technology, engineering and mathematics by sparking children’s interest in those fields.

The spring semester event is for kids between the ages of 8 and 12 who live within a one-hour driving distance of BGSU.

There is a $25 registration fee to participate; scholarships will be available.

All students will receive a lunch card and a "TKU" T-shirt.

The program is held in the same lecture halls used by BGSU students.

The morning sessions feature a talk and extended question period with the invited speaker.

The afternoon sessions will include a series of hands-on activities relevant to the session topic that the children can participate in with their parents.

Registration is limited to 250 children, and starts at 9 a.m. on Dec. 12. Register online at http://kids@techuniversity-bgsu.xnet.edu/countryregistration.php

Following are the four sessions:

On Jan. 9, Dr. Jennifer Ray of the National Center for Climate Research in Boulder, Colo., will discuss "Climate Change: What, When, Why and Where?" Her Web site is http://www.ged.ucar.edu/staff/presentations/

On Jan. 16, Dr. Craig Janelle, a BGSU professor of mathematics and statistics, will share "Practical Math for the Digital Age." Learn more about him at http://www.math.bgsu.edu/

On April 6, Dr. Brett Tyler, director of the Center for Genome Research and Biodiversity at Oregon State University, will present "Why My Banana Doesn’t Get the Flu." His Web site is http://cgrb.oregonstate.edu/talks/

In the last session, on April 13, Dr. Ron Wolford, Distinguished Research Professor of biological sciences at BGSU, will speak about "What Can Aids Tell Us About Human Health and Evolution?" These who are interested can learn more about his work at https://www.bgsu.edu/departments/biology/people/wolford.html

Kids’ Tech at BGSU is directed by Dr. Paul Monroe, a professor of biology, and is funded through the NSF and a U.S. Department of Agriculture National Institute of Food and Agriculture grant, which calls for participating universities to help prepare the next generation of scientists.
Students dive into BGSU marine lab

Written by Harold Brown / Sentinel City Editor
Saturday, 06 October 2012 07:59

Justin Grubb thought he had found a special place as a high school student when he visited the marine laboratory at Bowling Green State University.

"It looked cool. The students were working and getting hands-on experience," Grubb said.

Now a junior at BGSU, Grubb is one of five student assistant lab coordinators. He spent five weeks last summer on an internship in Costa Rica.

Marine Lab Coordinator and lecturer Dr. Matt Partin points to Grubb as an example of more than 150 students enrolled in the marine and aquatic biology specialization program.

"The lab helps student retention, giving the students a place to hang out, a place where they can belong to both the (biology) department and to the university," Partin said. The program has been growing quickly since the specialization degree was approved. It is the only program of its kind in Ohio, Partin said.

Dr. R. Michael McKay, Ryan Professor of Biology and director of the marine program, said the specialization gives students recognition for their work and makes it easier to track the growth in the program. He said 75 students entered the program this fall.

Partin said it isn't just biology students who take an interest in the lab. "The treasurer of the Student Marine Biology Association is a business major."

Partin holds three degrees from BGSU and worked at an aquarium before returning to BGSU in 1999 to oversee the marine lab.

"Students like to show off their tanks to friends and family. They spend a lot of time here with the animals," Partin said.

Many of the animals come from breeders but the lab also collects some animals during field trips and accepts some donations. "We only take what will do well in an aquarium," Partin said.

To help with student recruitment, Partin uses a showcase display outside the lab featuring a digital picture frame of photos from field trips and boards filled with business cards of alumni.

Grubb started volunteering in the marine lab as a freshman, taking care of a coral tank. He's now responsible for four 100-gallon tanks, along with assistant coordinator duties making sure others are taking care of their responsibilities.

He has started a tank based on a Mangrove tree system, which has a sting ray as its primary resident. In Costa Rica, Grubb lived with a host family that spoke only Spanish. He set up a reef tank from scratch there and showed students there how care for the tank. He also set up a display at a Costa Rica street to educate tourists about the illegal exotic animal market. Grubb said it is illegal to take shells from the country. "The shells in the exhibit had been taken from tourists by customs," Grubb said.

The trip also allowed Grubb to travel to a rain forest.

Partin said some student internships are done at BGSU but most are off campus. Some are as close as the Toledo Zoo, while others might be as far away as South Africa. Alumni play a key role in helping with internships.

Partin said students also help with tours of the BGSU herparium, the greenhouse and the marine lab, which are given on Thursday mornings. All are located in the Life Sciences Building. A highlight is a "touch tank" that allows visitors to handle marine creatures. Public tours are usually conducted Thursday mornings. Groups should make prior arrangements.

McKay said young people interested in a biology need to "take more than the minimum requirements in math and science classes. The biggest challenge with low math skills is the amount of college course work that will be required."

He said instructors are being added to help handle the growing enrollment and to expand areas of expertise, including larger animals such as sea otters and dolphins.

Started in 1963 by faculty member Cynthia Stong and a group of students who put five 10-gallon tanks together with animals from a field trip, the lab now has more than 50 tanks with more than 3,000 gallons of water.

"She has been a real rallying force for the program. She has kept track of her students. It has been important to help keep older alumni interested," Partin said. Stong received an honorary doctorate of science education from BGSU a few years ago.

A 50th anniversary event is being planned for 2013 Homecoming weekend.

http://www.bgsu.edu/departments/biology/facilities/marine/mainpage.html
Proving chemical caused cluster could prove difficult

Clyde — Scientists said that it could be difficult to prove a commonly found chemical caused the local childhood cancer cluster that sickened more than 30 children.

Attorneys for families of those affected by the eastern Sandusky County cancer cluster are trying to prove benzaldehyde, a liquid that evaporates when exposed to air and is used as a food flavoring, in cosmetics and as a solvent, is the cause of the cluster. The attorneys are pursuing a class-action lawsuit against Whirlpool Corp.

Benzaldehyde is the only common denominator that has been found among some of the cancer victims, said Alan Mortensen, a Salt Lake City, Utah, attorney representing them. The chemical was found in dust in the attics of five Clyde homes, and cancer victims had lived in four of them.

Mortensen has said elevated levels of benzaldehyde were found in the attics. But Bob Midden, Bowling Green State University associate professor of chemistry who reviewed the report of dust sampling, said the levels were much lower than standards that would trigger a U.S. Environmental Protection Agency investigation.

Mortensen alleges Whirlpool released benzaldehyde and caused the cluster. Whirlpool's top spokesman, Jeff Noel, said benzaldehyde is not a core part of its manufacturing at the Clyde plant — where it makes washing machines — but Whirlpool is looking at its supply chain to determine if benzaldehyde is used there.

Determining the cause of any cancer cluster is extremely difficult, said Dr. Scott Mason of the National Toxicology Program at the National Institute of Environmental Health Sciences.

"It almost never happens," he said. "It's very frustrating to all the parties involved."

An agent can take 20 years to cause cancer in a person, making it difficult to pinpoint an exact cause, Midden said.

In this case, proving benzaldehyde was the culprit adds additional challenges, because it is generally recognized as safe, Midden said.

Benzaldehyde occurs naturally in the environment and is found in fruits and plants, he said.

Benzaldehyde is used in a variety of products, including soap and perfume.

At the levels found in cosmetics, benzaldehyde is not considered a carcinogen in people, according to the National Institutes of Health.

"Because it's such a safe chemical, you can have college students make it in the lab," Midden said.

Mortensen has cited a New Jersey Department of Health and Human Services fact sheet that said benzaldehyde can cause genetic mutations and that determining whether it is a cancer hazard needs further study.

He also said cancer had been found in a study of 160 animals.

"The available evidence is so weak that benzaldehyde is a carcinogen," Midden said. "There is no evidence that indicates it's a human carcinogen."

The National Toxicology Program found no evidence that benzaldehyde caused cancer in rats, but did see some cases of cancer among mice, Mason said.

"We only saw a relatively small number of tumors in mice," he said.

In very high levels, benzaldehyde — which has an almost odor — can be an irritant, Mason said.

"You would definitely smell it," he said.

"It might make your eyes water."

The levels of benzaldehyde found in the attics are lower than the standard that would cause the U.S. EPA to investigate and perhaps do a cleanup, Midden said.

The report done on the attic testing, which took place in March, lacks a comparison to attics in areas with normal rates of cancer, he said.

Because benzaldehyde is so common, it might not be unusual for it to be found in attic dust, he said.

"You would call it control data," Midden said. "To satisfy a scientist, you would need a lot more data than what's here. The biggest weakness is the small number of samples."

The report was prepared by Ventila Environmental Partners of Pleasant Grove, Utah. Mortensen was not available for comment.

Midden spoke to The News-Messenger in order to help explain the report results.

For disclosure purposes, he said his wife works at the Sandusky County Health Department, which has investigated the cancer cluster.

"I have nothing at stake in this one way or another," he said. "If anything, I sympathize with the families. Ultimately I'm a scientist, and my loyalty lies with science."

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Twitter: @kristinasmithNM
Appendix B: Faculty and Student Recognition cont.

Mazey reveals record grant in BGSU State of University speech

Written by: BY HAROLD BROWN, SENTINEL-TRIBUNE CITY EDITOR.

Wednesday, 19 September 2012, 11:24

A record $7 million external grant, a commitment to market salaries for faculty and enrollment growth to 25,000 by 2020 were among the highlights of Bowling Green State University President Dr. Mary Ellen Mazey's State of the University address Wednesday afternoon.

"We were very excited to learn this week that the Northwest Ohio Center for Excellence in STEM Education at BGSU has been awarded more than $7 million from the National Science Foundation," Mazey revealed during her 30-minute speech in Donnell Theatre of Wolfe Center for the Arts.

STEM stands for science, technology, engineering and math, which national leaders say the United States must excel if it is to remain competitive in the world.

Mazey singled out Dr. Robert Middlen, an associate professor of chemistry and director of the center, for his leadership on the grant. The university will receive the money over a period of five years. The grant is one of five awarded nationally.

After the address, Middlen said the center will work with Sandusky Perkins and Sandusky City Schools, building on an existing program at Perkins that Sandusky schools have been collaborating with and establishing because of its success. The program is based in the lower grades to encourage students to build their interest and skills in the STEM classes.

Middlen said the university was a good candidate for the funds because of its previous work with National Science Foundation grants. "We have had a good indication that we were going to get the grant since June. Experience has taught us that if they call and ask questions it is a good sign," he said.

About 30 faculty are directly involved and many others involved in various partnerships.

Mazey said the grant is an example of how the university intends to double its outside grants and funding to $30 million a year.

Dr. Michael Ogieva, vice president for research and economic development, said the goal will be a challenge because BGSU does not have a medical or engineering component, which tend to receive larger grants.
BGSU President delivers state of the university address

BGSU President delivers state of the university address

Bowling Green State University President Dr. Mary Ellen Mazey delivered her state of the university address Wednesday afternoon:

"We have had a good beginning to the 2012-13 academic year and today we are here to celebrate our successes and outline our priorities and goals moving forward and update you on plans for BGSU's future.

In short, the state of the University is very strong and its future is in our hands. We continue to be ranked as a first-tier public university by US News and World Report and our first year programs have been recognized in that publication as well.

Enrollment, while down modestly this year, is solid. And our students, faculty and staff continue to be recognized for their work and achievements both in and out of the classroom. The completion of the first phase of our campus master plan has begun to create a vibrant atmosphere on campus.

Like our peers in higher education in Ohio and throughout the world, we do face significant challenges. But I'm confident that together, we can make this great University even stronger. On April 15, 2013, we will have the Higher Learning Commission, our accrediting body, on campus, and it is very important to all of us that the visit be a successful one for BGSU.

Enrollment

First, let's talk about the livelihood of any University -- enrollment. We've done well over the last several years, with several large freshman classes. But I believe we still have tremendous growth potential. And our state needs us to do more.

Ohio's numbers may surprise you -- in the last three to one of our residents -- 24 percent -- hold a bachelor's degree or higher degree compared to 30 percent nationally. Even more startling is that means Ohio ranks as the 39th state in nation in the percentage of citizens with a bachelor's degree or higher.

Educating more Ohioans is a daunting challenge and the Governor and Ohio Board of Regents have called upon BGSU and our peer universities and community colleges to do more.

Last week I had an opportunity to meet with other presidents from colleges and universities throughout the state to hear the Governor's goals for higher education in Ohio as we approach a new biennium budget.

Let's review the goals:

1. Increase participation rates in higher education among Ohio high school graduates

And we were very excited to learn this week that the Northwestern Ohio Center for Excellence in STEM Education at BGSU has been awarded more than $7 million from the National Science Foundation to fund a five-year project titled "Evolve with STEM." Students in two school districts in grades three through eight will participate in research projects that will become the content for learning in all of their subjects -- not just in the sciences, but also in the social sciences, language arts, and the fine arts, as well as mathematics. This is an outstanding effort led by Dr. Bob Milidon and demonstrates internal university collaboration as well as a partnership with the public school systems.

Big Data Day on Sept. 7 was a resounding success. More than two hundred faculty attended over the course of the afternoon to hear from national experts and faculty colleagues about the research potential presented by the enormous amount of digital information being produced every day in all fields. We must position ourselves to be a leader in business analytics, sciences, social sciences, humanities, and health information systems.
Appendix B: Faculty and Student Recognition cont.

**Zoom News**

Bowling Green State University News Update

Bob Midden (left), discusses Event with Superintendent Eugene Sanders, Sandusky City Schools (center), and James Gunner, Perkins Local Schools (Haddon in Paul Daugherty, also of Perkins).

Science becomes focus for learning through Evolve

An ambitious project led by BGSA aims to focus learning on the educational needs of children and teachers by training them to be true "science citizens," said as part of a State of the World in a Gift of Mind.

Funded by a $2.36 million grant from the National Science Foundation, the five-year project of the "Evolve with STEM" will work with 1,012 school districts over a period of five years. Teachers and students will collaborate to learn about STEM and other partnering colleges and universities and nonprofit agencies to form groundbreaking new communities.

Project leader Dr. Bob Midden, a BGSA chemistry faculty member and director of the Northwest Ohio Center for Excellence in STEM Education, said, "We want to improve science education by showing how the scientific process is used to solve real-world problems that impact the lives of people in their communities and our nation. The goal is to give them a sense of purpose and a context for their learning that helps them make the connections that deepen their understanding."

The basis of Evolve is Inquiry and Engagement to Neurologically and Optimizes Learning for Everyone with Science, Technology, Engineering, and Mathematics (STEM), and is informed by the STEM Education Standards.

Dr. Eugene Sanders, superintendent of Sandusky City Schools, and I’m excited about the idea of having a focus on science and apply it in a very practical way."

The program comes just in time for schools to address the higher core standards the state has adopted, said Perkins Superintendent James Gunner. "The new standards are much more rigorous and will be in place by 2015. They call for higher expectations of students and teachers in grades 9-12 and add new topics such as algebra, geometry, and advanced science courses.""Evolve with STEM" will start with students and teachers in grades 9-12 and add students in grades 6-8 starting in 2014. Teachers will participate in three years of professional development that will involve workshops each summer and spring meetings during the academic year.

Among the numerous other external partners are the Ohio State University State Lab, the University of Toledo, Lorain County, Owens Community College, the Toledo Zoo, and the Toledo Zoo.

In addition to Midden, co-principal investigators for the grant include superintendents Gunner and Sanders, Dr. Emily Zuehls, School of Teaching and Learning, and Michelle Heafy, center director for the Toledo Zoo. A number of other BGSA faculty will play major roles in the project as well.

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**BGSU**

In the news

**Messer-Kruse on Wikipedia policies 2014**

**Miller on the enduring ritual of political rallies: Bowser**

**The art of disco dancing features BGSU Libraries video**

**BGSU Libraries video**

**BGSU Libraries video**

Silent Witness changed, Valenti said.

The location for Nondap’s Giant Witness is still being decided, called the "aural documentary." The "Science" will be shown, and BGSA welcomes international graphic design firm Ruck/Valenti for a show and talk.

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**MAZEY@BG**

A Message from the President

Dear Alumni and Friends:

I hope you were able to join us for homecoming over the weekend. We capped our weeklong celebration with a 48-8 win over Rhode Island and welcomed back the classes of 1962 and 1972 for reunions.

One of the highlights of the ceremony was the honor of inductees into our Academy of Distinguished Alumni: Joseph Pinko’76, president and CEO of Traffic Audit Bureau for Media Management, Inc.; Ed Reiter’52, retired senior chairman of Sky Financial Group; Ursula Watters’75, vice president for government relations at John Hancock Insurance Company; and Jack Williams’79, partner with the law firm of Wamble, Carlyle Sandridge & Rice. Follow the links above to view the compelling videos recognizing each inductee.

In mid-September I gave my State of the University Address. We celebrated the accomplishments of the past year and outlined our goals for the future -- including plans to reach an enrollment of 25,000 students by the year 2020. At the same time, we’re committed to improving quality and have set aggressive but achievable goals for raising the academic profile of our student body.

I was very excited to learn that the Northwest Ohio Center for Excellence in STEM (Science, Technology, Engineering, and Mathematics) Education at BGSA has been awarded more than $7 million from the National Science Foundation to fund a five-year project titled "Evolve with STEM." I believe this is the largest grant of its kind in BGSA history.
Science becomes nexus for learning through iEvolv

BOWLING GREEN, O.—An ambitious project led by Bowling Green State University aims for no less than transforming the educational lives of children and teachers by training them to be true "citizen scientists," as does William Blake, "to see a world in a grain of sand."

Funded by a $7.28 million grant from the National Science Foundation, the five-year project titled "iEvolv with STEM" will work with two K-12 school districts as core partners, Perkins Local Schools and Sandusky City Schools students in grades 3-8 and their teachers will collaborate with scientists at BGSU and other partnering colleges and universities and nonprofit agencies in a groundbreaking new curriculum.

Project leader Dr. Bob Midian, a BGSU chemistry professor and director of the Northwest Ohio Center for Excellence in STEM Education (NWO), said: "We want to improve science education by allowing even the youngest children to participate in real research that addresses real scientific issues that have a bearing on the health and welfare of people in their communities and elsewhere. The goal is to give them a focus and a context for feel learning that helps them make the connections that deepen their understanding."

The basis of iEvolv is science becomes the nexus for the study of everything, from language arts and reading, mathematics and social sciences to the arts. Midian said: "With the Monarch Watch project, for example, one of the curriculum modules, students can also study the social, political, economic and geographical factors surrounding the butterflies' existence. They can improve their language skills by reading and by writing about their research findings. These projects add meaning and enhance the development of knowledge students will need to solve complex problems."

Dr. Eugene Sanders, superintendent and CEO of Sandusky City Schools, said he is "delighted to be a part of the National Science Foundation funded grant focusing on citizen scientists, and is excited about the idea of "emerging theory and practice, in which our students can learn science and apply it in a very practical way. Extending learning beyond the classroom into the community will be a great opportunity, and having one of the Great Lakes in our backyard presents a unique educational experience for our students."

Three of the research projects are national and international in scope: GLOBE, a large-scale, international environmental research project comprising students in more than 110 countries; Monarch Watch, funded by National Geographic; and iDance, a project also involving students in Germany. For instance, the Monarch project will also connect with the Ohio Leptographia Long Term Monitoring of Butterflies, and a rain garden project will connect with the Erie County Soil and Water Conservation District's ongoing rain garden initiative. All of the research projects relate to the local environment in some way and will be aimed at benefiting the local community.

iEvolv (Inquiry and Engagement to Invigorate and Optimize Learning for Everyone with Science, Technology, Engineering and Mathematics) will help students and teachers learn how to fully participate in these real science research projects and help the schools integrate these research projects across the curriculum throughout the other areas of study. Citizen science research projects are specifically designed for participation of nonprofessional scientists such as grade school and high school students and teachers.

The timing and nature of iEvolv with STEM were a perfect fit for Perkins, said Superintendent James Gunter. Perkins has focused aggressively on boosting STEM education for several years and has implemented educational technology in the classroom to help the diminishing number of kids interested in the STEM fields and approach universal success in math and science, he said. "The beauty of the iEvolv grant for us is that it will allow us to migrate that down to the lower grades."

This comes in time for schools to address the higher core standards the state has adopted, he added. "The new standards are much more rigorous and will be in place by 2015. They call for more higher-order thinking skills and are really asking kids to think more, analyze more, synthesize more information and produce results."
Appendix B: Faculty and Student Recognition cont.

August 30, 2012

Sink your hands into science at STEM in the Park

What do you get when you cross a giant bubble, a snake, and a mechanical engineer? You get STEM in the Park, a family day of hands-on fun at the University featuring a free lunch, take-home science, technology, engineering and mathematics (STEM) activities, and everything from sea creatures to pop rocks. Activities will take place from 10 a.m. to 1:30 p.m. on Sept. 8 in front of the Bowen Thompson Student Union (rain or shine).

Parking is free in lots A and G on Westerly Street and in lots 4, 4A and E off Thurner Avenue. In the event of inclement weather, STEM in the Park will be held inside Perry Field House, with free parking available there. Visit http://nwoce.org/STEMinthePark for updates and more information.

The STEM in the Park was the brainchild of Drs. Emiko and Lena Quan, College of Education and Human Development. Inspired by Literacy in the Park, a spring on-campus event that brings families in for a variety of literacy-building activities, STEM in the Park seeks to increase public engagement in science, technology, engineering, and mathematics.

The day features interactive displays and activities created by community partners and area universities to engage children of all ages with STEM. More than 30 exhibits will host hands-on activity stations with over 80 tables of activities. STEM in the Park visitors can see robots, pet lizards, play with bubbles, batise in robotics and make ice cream.

NWO, the northwest Ohio Center for Excellence in STEM Education at BGSU, organizes the free event on campus for the entire northwest Ohio and southeast Michigan community. NWO is a partnership among a number of area universities, K-12 schools and community partners who come together to showcase innovation and educational opportunities and promote positive attitudes toward STEM teaching and learning.

Activity stations include BGSU’s Marine Lab, Challenger Learning Center of Lake Erie West Imagination Station, PNC Bank, PHS Norwalk Chapter, Ohio Northern University, and the University of Toledo.

Last year’s event attracted over 1,700 people from northwest Ohio and southeast Michigan.

Sponsors for the 2012 STEM in the Park event include Kroger, BP-Hockey, LLC; Connect-a-Million Media; A Time Killer Cable Initiative; the BGSU Foundation; Wal-Mart; Ohio STEM Learning Network; UnitedHealth, the Bowling Green Community Foundation and Carolina Biological, as well as many of BGSU colleges and departments, with additional help from The Andersons and Coca-Cola.

July 2012

The STEM Classroom

Recent reports point out that minorities and women are underrepresented in the STEM fields:

- STEM Gender Gap Pronounced in U.S. (Education Week)
- Higgs Discovered: Giants of Physics Overlooked (NewScientist)
- Data Show Disparities in Access to High-Level STEM Courses (Education Week)

Don’t Miss Out

The Third Annual STEM in the Park day sponsored by Bowling Green State University in Bowling Green, OH, September 8, 2012
Appendix C: History Lab Recruitment Email

A new teacher professional development opportunity...

HISTORY LAB: A Hands-on Exploration of Local History, Culture and Science at Fort Meigs

Summer 2012
June 27, 28, and 29 at Fort Meigs in Perrysburg, OH
from 8:00 am-4:00pm

What will I gain from History Lab?
• Convenient and fun summer professional development using inquiry-based teaching strategies and formative assessment to improve content knowledge in social studies and science at no cost to you or your school district.
• A broader understanding of this region's history and culture through visits to Ft. Meigs and other historical sites in the area and experiences with history scholars and experts.
• 24 Contact Hours (at no cost) or 1 hour of graduate credit from BGSU (for an additional fee).
• Humanities and science materials and resources to use in your classroom including problem-based learning activities taught by history, science and education faculty and informal educators.
• Two follow up workshops in the Fall of 2012 NWO Inquiry Series with additional materials and resources and contact hours (Fall schedule will be announced at the summer workshop).
• Activities to help teach about the Bicentennial of the War of 1812.

The workshop is FREE to educators. Food, materials and contact hours will be provided. Graduate credit is available for an extra fee (TBD).

Questions? Please contact: Rick Finch, Site Director at Ft. Meigs in Perrysburg, Ohio (rfinch@ohiohistory.org) or Michelle Klingler, Asst. Director NWO at BGSU (mklingler@bgsu.edu)

Space is limited! Please register online today at: https://www.surveymonkey.com/s/77MDBLZ

History Lab is a partnership project between Bowling Green State University and Fort Meigs - Ohio's War of 1812 Battlefield

Funding is provided by Ohio Humanities Council
Appendix D: Learning Community Poster

HiTech STEM Learning Community: Highly Engaging Learning Environments by Design!

Co-Facilitators: Jodi Haney (STL & DES) & Matthew Partin (BIO) 
Participants: Lisa Addis (NWO/COSMOS), Jessica Belcher (NWO/COSMOS), Peter Blass (CHEM), Kate Enckenthal (PHYS), Emilio Duran (STL & BIO), Shannon Finerty (BIO), Bob Midden (NWO/COSMOS & CHEM), Holly Myers (DES), & Eileen Underwood (BIO)

HiTech STEM Learning Community Road Map

BGSU faculty and administrative staff with a common interest in STEM (Science, Technology, Engineering, and Mathematics) teaching and learning collaboratively examine and design high tech and highly engaging environments to enhance student attitudes, motivation, engagement, and ultimately success! This learning community is affiliated with COSMOS (BGSU’s Center of Excellence in Science and Mathematics Education), supporting the overriding goal of enhancing STEM education for people of all ages.

Notes:
* Dashed lines represent illustrative connections between ideas, but there are obviously many more!
* This concept map was made using iMindMap!

WEB 2.0 Tools
- Mobile Apps
- Web 2.0 tools
- Hi-Tech Devices
- Educational Tools
- Social Media
- Future Explorations
- Productivity

BGSU
Perkins Local Schools Pilots the Literacy Design Collaborative College Ready Tools

Literacy Design Collaborative College Ready Tools (LDC - CRT) are being adopted in Perkins Local Schools to provide inspiration and support for adoption in other schools throughout Northwest Ohio. CRT is a system of learning for all of the core academic disciplines including English language arts, social sciences, natural sciences, and mathematics. CRT focuses on development of literacy skills within each of these primary domains with the aim of improving student mastery of the common core standards.

CRT instruction is based on teaching modules. At the core of a teaching module is a specific teaching task, which is a writing assignment with a given purpose: narrative, argumentation, or informational/explanatory. These are usually oriented around a big question of some significance. In addition to the teaching task or overall assignment, the module includes mini-tasks that are designed to develop students’ ability to successfully complete the teaching task. Modules also include well-defined rubrics that guide student completion of the assignment and are used by teachers to assess student mastery.

continued on page 2
Appendix E: “NWO STEM Connection” Print and E-Newsletters cont.

E-Newsletter Sample
Appendix F: NWO STEM Education Inquiry Series Advertising

**STEM Speaks!**

**NWO STEM Education Inquiry Series 2012-13**

**STEM Professional Development for preK-12 Teachers & Administrators**

*Each event runs from 5:00 - 8:00 pm at WGTE Public Media, Toledo, OH*

Registration Fee: $20/night (includes dinner)

**October 2, 2012 ~ Ms. Page Kealey** (Registration open: Aug. 6 - Sept. 24)
Supporting Science Inquiry Through Formative Assessment

**November 27, 2012 ~ Ms. Emily Morgan & Ms. Karen Ansberry** (Registration open: Oct. 3 - Nov. 19)
Picture-Perfect Science: Using Picture Books to Guide Inquiry
(this event is supported in part by Carolina Biological Supply)

**January 8, 2013 ~ Dr. Susan Everett** (Registration open: Nov. 28 - Dec. 31)
Everyday Engineering: Integrating the STEM Disciplines

**February 12, 2013 ~ Mr. Karl Klimek** (Registration open: Jan. 9 - Feb. 4)
Generative STEM Teaching Practice Through a Brain-Mind Lens!

**March 12, 2013 ~ Dr. Daniel Brahier** (Registration open: Feb. 13 - March 4)
Rethinking Mathematics as a Verb

Information, directions, & registration available at: www.nwocenter.org/inquiryseries

Contact Hour Certificates available for ALL events

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8.5 x 11 Flyer

Supported by Battelle/OSLN
Appendix F: NWO STEM Education Inquiry Series Advertising cont.

Recruitment Email Samples

SAVE THE DATES!
NWO Inquiry Series 2012-13

STEM Speaks!

October 2, 2012
~ Page Keeley, author of the Uncovering Student Ideas in Science series

November 27, 2012
~ Karen Ansberry & Emily Morgan, authors of Picture-Perfect Science Lessons and More Picture-Perfect Science Lessons

January 8, 2013
~ Susan Everett, co-author of Everyday Engineering

February 12, 2013
~ Karl Kilmeek, author of Generative Leadership: Shaping New Futures for Today’s Schools and co-author of 12 Brain-Mind Learning Principles in Action: Developing Executive Functions of the Human Brain

March 12, 2013
~ Dan Brahier, BGSU Faculty and author of Panning for Gold: 15 Investigations to Enrich Middle School Mathematics

For more information visit: www.nwocenter.org/inquiryseries

This event is supported by Battelle/OSLN

STEM Speaks!
NWO STEM Education Inquiry Series
2012-2013

March 12, 2013
(Registration open: Feb. 13 - March 4)

5:00 - 8:00 pm at WGTE Public Media, Toledo, OH
Registration Fee: $20 (includes dinner)

Dr. Dan Brahier
BGSU Faculty and author of Panning for Gold: 15 Investigations to Enrich Middle School Mathematics

Registration fee includes:
• Dinner
• Contact Hours Certificate
• Teaching resources and hands-on materials

Note: School funds may be used to pay for sessions. Check with your administrator.

Click here to register online!

For more information visit: www.nwocenter.org/inquiryseries

This event is supported by Battelle/OSLN
Appendix G: NWO Publications and Presentations

Publications


Matney, G. (in press). Early mathematics fluency with the CCSSM. *Teaching Children Mathematics*.


Appendix G: NWO Publications and Presentations cont.


Presentations


Appendix G: NWO Publications and Presentations cont.


Matney, G. & Bostic, J. (2012, October) The Big Core Theory: Teaching and Learning the Common Core. Ohio Council of Teachers of Mathematics, Columbus, OH.

Matney, G., & Daugherty, B. (2012). We're seeing spots: Visions of multiplicative sense making. Regional meeting of the National Council of Teachers of Mathematics. Chicago, IL.


Appendix H: NWO Symposium Advertising

2012 NWO Symposium

Saturday, October 27, 2012 8:30 am - 4:00 pm
Olscamp Hall @ Bowling Green State University

Content Strands Featured at the 2012 Symposium
• Integrating Technology in the Classroom
• Putting Creativity to Work: Teaching STEM With Innovation
• STEM in the Community: Thinking Outside the Classroom
• Teaching and Learning in ENGINEERING
• Teaching and Learning in MATHEMATICS
• Teaching and Learning in SCIENCE

Full program available at: http://nwocenter.org/nwoSymposium

Registration Fee Includes:
• 7 hours of high quality professional development
• Keynote address by inspirational speaker and chalk artist, Kelly Croy
• Personal sized print of the art Kelly will create during his presentation. (Kelly is available after his presentation to autograph the print art and take pictures with the large chalk art piece.)
• Conference bag and digital inquiry starter kit
• Light breakfast and full lunch

$35 (deadline Oct. 19); $45 Onsite

Multiple Participant Discount ($30/person) for 5 or more participants from the same school

Note: You can use Title I Part A Funds, Title III Funds or School Improvement Funds.

This event is supported by Battelle/OSLN

Contact Hour Certificate Available
Appendix H: NWO Symposium Advertising cont.

Recruitment Email - Attendee

Online Registration Closes October 15!

Saturday, October 27, 2012
Time: 8:30 AM - 4:00 PM

Location:
Olscamp Hall, Bowling Green State University
Bowling Green, OH 43403

Registration Fee: $35 (online by Oct. 15)
$15 for undergraduate students (online by Oct. 15)

Registration Information available at:
www.nwocenter.org

For more information contact nwo@bgsu.edu, (419) 372-2718

Featuring a keynote presentation by inspirational speaker and chalk artist, Kelly Croy. Kelly has been featured on CNN, USA Today, MSNBC, The Armed Forces Network, Countdown with Keith Olbermann, and more. Come and experience Kelly’s inspirational message and watch as he creates a beautiful piece of art right before your eyes. Learn more at www.KellyCroy.com.

This event is supported by Battelle/OSLN.
Appendix H: NWO Symposium Advertising cont.

Recruitment Email - Presenter

Recruitment Email - Vendor
Appendix I: OJSHS Recruitment Email

March 20-22, 2013

The 50th Annual Ohio Junior Science & Humanities Symposium
hosted by Bowling Green State University

Call for High School Research Papers and Posters

Call for High School Research Papers and Posters

Sponsored by the Northwest Ohio Center for Excellence in STEM Education (NWO) and The School of Teaching and Learning at Bowling Green State University.

In cooperation with The Academy of Applied Science and with the support of the Departments of the Army, Navy, and Air Force.

Important Deadline ~ February 20, 2013

- Online registration is required for all participants including Paper Presenters, Poster Presenters, Teachers, Student Delegates.
- Registration fee: $25 per student
- Poster Presenters must submit an Abstract during the registration process.
- Paper Presenters must submit an Abstract and a copy of the Research Paper during the registration process.

Registration Dates: December 21 - February 20, 2013
Register Online at: www.ojshs.org
Appendix J: Project pi r² THREE Recruitment Materials

Project pi r² Three
Partners in Inquiry Resources and Research

What is pi r² Three?
Project pi r² Three, Partners in Inquiry Resources and Research, is an exciting program offering 105 contact hours of high-quality, research-based teacher professional development for Ohio teachers in grades 2-5 on inquiry science and STEM-related curricula. Project pi r² Three is a grant-funded program offering no-cost, Ohio Revised Academic Content Standards-based sessions, classroom outreach programs, science and cross-curricular materials, and a $300 stipend to grades 2-5 teachers who participate.

Register Today!
Please complete the registration form at http://www.surveymonkey.com/s/RXZRRY

Project pi r² Three is open to Ohio grades 2-5 teachers of all subject areas who would like additional professional development in inquiry and STEM subject areas.

Why Project pi r² Three?

- **PHASE I: Engaging Summer Institute**
  Summer Session 2013 will provide exciting opportunities for second through fifth grade teachers to participate in hands-on content sessions relevant to the revised science standards at each grade level. Experienced science educators along with scientists will deliver high quality investigative sessions in a ‘5E’ lesson format along with assistance of community resource partners. Teachers will come away with ready-to-go units to implement in their classrooms.

- **PHASE II: Academic Year Activities**
  Teachers will participate in the highly popular STEM in the Park and NWO Symposium events. Participants will also engage in four cohort meetings (Oct. Dec., Feb., Apr.) which will be facilitated in a ‘lesson study’ format as participants reflect and report on the 5-E investigative units in which they are integrating in their classrooms. Community resource partners will also be collaborating in classroom lessons.

- **PHASE III: Dissemination and Reflection**
  A final phase of professional development will focus on teacher reflective practices. This phase will also include teachers hosting a ‘Science Expo’ in their schools where students will work collaboratively to highlight the design process of an investigation completed in the classroom.

- **Community Resource Partners**
  Regional partners which include local STEM-related businesses and informal educators will collaborate with participants to bring a variety of hands-on, inquiry based explorations to their classrooms and interact with students.

Professional Development

**Academic Year 2013-2014**

- **Summer 2013**
  - Eight days (July 8-11 & July 15-18, 2013 from 8:30 am - 3:30 pm)

- **School Year Sessions – 2013-2014**
  - Two Saturdays (Sept. 7 and Oct./Nov.: NWO Symposium)
  - Four evening sessions (Oct., Dec., Feb., April from 5-8 pm)

**Community Resource Outreach**
- Community Resource Partners will be available to visit classrooms to increase the rigor of science lessons (scheduled with teachers between October and May)
- Online wiki sharing teacher reflections, lessons, and science content questions

**Incentives:**
- 105 contact hours (10 CEUS) from BGSU for the summer and academic year workshops
- $300 stipend ($150 during the academic year and $150 for the summer workshop)
- A wealth of standards-aligned, high-quality cross-curricular and classroom science materials
- 3+ hours of free outreach programming in your classroom via scientists, informal educators, and/or local STEM related businesses
- Optional BGSU graduate credit (summer and academic year – 2 hours each) at an additional cost.

Questions
Please contact:
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www.nwocenter.org

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Appendix K: STEM in the Park Advertising

**Free Family Event**

**Saturday, Sept. 8, 2012**

10 am – 1:30 pm at BGSU

**On lawn by Student Union • FREE Lunch**

Science, Technology, Engineering, and Mathematics

FREE parking in lots A & G on Wooster or 4, 4A, & E on Thurstin

What do you get when you cross a giant bubble, a snake, and a mechanical engineer? You get... STEM in the Park

Join us for a family day of hands-on fun at Bowling Green State University (rain or shine) featuring a free lunch, take-home STEM activities, and everything from sea creatures to pop rockets. You won’t want to miss it!

**STEM in the Park** will feature interactive displays and activities created by community partners and area universities to engage children of all ages in science, technology, engineering, and mathematics.

While at STEM in the Park 2012 enjoy activities and information provided by:

- Bowling Green State University
- BGSU Program
- Bowling Green Early Childhood Learning Center
- Bowling Green Fire Division
- Challenger Learning Center at Lake Erie West
- Connect A Million Minds, an initiative of Time Warner Cable
- Davis-Besse Nuclear Power Station (of First Energy)
- Eduworth/SDC Creations Ltd.
- E S Wagner
- Get School of Western Ohio
- Imagination Station
- Imagination Station Metroparks of the Toledo Area
- Nature’s Nursery
- New York Life Insurance Company
- NWOET
- Ohio Northern University
- PNC Bank
- PVS Alkwood Chemicals, Inc
- Rain Garden Initiative
- Rainbow Cooperative Preschool
- Radiant Music Circles
- Sauder Village
- Scared Hen
- SETGO Program
- Seven Eagles Historical Education Center
- The Letthffy Company
- The Toledo Zoo
- Toledo Science Academy
- University of Findlay
- University of Toledo Student American Chemical Society
- West Side Montessori School
- Wood County District Public Library
- Wood County Historical Center & Museum
- Wood County Hospital
- Wood County Park District

**FREE Lunch from 11:30 am - 1:00 pm while supplies last**

(Rain site: Perry Field House)

**Visit the website for more info at** www.nwocenter.org/STEMinPark

8.5 x 11 Flyer
11 x 17 Poster

4 x 6 Postcard
Appendix K: STEM in the Park Advertising cont.

Recruitment Email

We are excited to invite you to participate with NWO/COSMOS at our fourth annual STEM in the Park event! This event will be Saturday, September 7, 2013 from 10AM-2PM on the campus of Bowling Green State University. Last year's event drew close to 2,700 people! This is almost 1,000 more than the previous year! This family day of exciting hands-on STEM activities is growing thanks to your participation!

What is STEM in the Park?

STEM in the Park offers hands-on, family-friendly science, technology, engineering and mathematics activities, displays and/or equipment at a number of STEM Stations arranged in an open, festival-like atmosphere. We invite you to select an activity or interactive display to bring to the event. In 2012, close to 2,700 people attending STEM in the Park with their parents, grandparents. STEM in the Park is a highly visible and unique opportunity for businesses, universities, colleges, and non-profit organizations to increase awareness and showcase regional STEM opportunities, careers and innovation across northwest Ohio.

NWO’s STEM in the Park provides:

- An eight foot table
- Free printing of STEM in the Park Take Home Activity cards for your table
- Tablecloth
- Two chairs
- Free lunch for all of your station staff & volunteers
- Additional space or table for large displays/activities is available
- Your company, college, department, or campus organization name will be featured on our website and in some larger marketing materials for this event.

Information regarding the previous years' STEM in the Park events can be found at nwocenter.org/STEMinPark

Exhibitor provides:

- Hands-on activity plus materials for attendees to complete the activity
- The text for a STEM in the Park Take-Home Activity (see example, if desired)
- Take Home brochures and marketing material featuring your company, department, college or campus organization (if desired)

Registration:

Please click here to complete registration form

Questions? Contact Jenna Pollock at NWO/COSMOS (jpolloc@bgsu.edu) or Dr. Emilio Duran (eduran@bgsu.edu), School of Teaching and Learning.

If this email was forwarded to you and you would like to be placed on our contact list for updates about this particular event, please email Jenna Pollock at jpolloc@bgsu.edu. We will see that you receive future communications regarding STEM in the Park 2013.
Teachers: Announcing an exciting learning opportunity for students grade 5-8 called "You Be the Chemist!"

FUN & INNOVATIVE academic competition engaging students in learning about important chemistry concepts, discoveries, and chemical safety. CHALLENGE COMPETITIONS across the country, encouraging the collaboration of community organizations, schools, and the chemical industry.

FREE ONLINE study materials!

TOP STUDENTS PARTICIPATE in the State Challenge. WINNER QUALIFIES for an all-expenses paid trip to the National Competition in Philadelphia, PA in June!

Participating is easy - please email Bob Mendenhall (Toledo Public Schools) at mendenh@tbs.org or call 419-671-8320 for more information. In the email include the following information: (RETURN BY DECEMBER 7, 2012)

Teacher Name:
Principal Name:
School Address (include County):
Number of Students Who Might Participate:

Please visit http://www.chemed.org/ybtc/ for more information.

This event is supported by

Northeast Ohio Center for Excellence in STEM Education